

SOME SOCIO-PSYCHOLOGICAL PROBLEMS OF FACTORY LIFE

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I. PROBLEM

THIS article aims at a descriptive analysis of the factory situation as experienced by the factory girl. While the number of psychological investigations into factory problems is increasing, they frequently seem to be conceived without the necessary background of knowledge about factory life. Apart from those studies, which ought to be called studies in scientific labour management rather than psychological studies, there are two main groups of investigations: One group devises ingenious experiments which lead in the end to the conclusion that the factory worker is not a machine functioning with mathematical accuracy, but a human being; it seems that such a 'result' could have easily been assumed by anybody setting out to investigate, especially by a psychologist. Another group of investigations selects a special problem without adjusting the concept and methods to the specific factory situation. In an otherwise excellent study of boredom in repetitive work, for instance, the authors include amongst other questions to the workers one as to their preference for promotion or higher wages.¹ Promotion and higher wages cannot, however, be co-ordinated if the social

¹ Wyatt, S. and Langdon, J. N. (assisted by Stock, F. G. L. (1937)). *Industrial Health Research Board*, Report No. 77.

situation in the factory is taken into account. An average worker has a negligible chance of promotion, but has really experienced, and has a far greater chance of again experiencing, what an increase in wages means. The first question, therefore, relates to the sphere of unrealizable imagination, the second to that of actual experience. The decision, when one is confronted with such an alternative, is meaningless because it has no relation to social reality.

The frequent method of approach by interviews or even by questionnaires constitutes another shortcoming of many an investigation. A method which has developed with undergraduates (who naturally are the most handy human 'material' for experiments in psychology), and is admirably fitted for investigating the educated and sophisticated mind, must fail when applied without alteration to the worker. The tendency of the latter to give the 'right' answer, to say what he thinks he is expected to say, is naturally great, and is increased when confronted with a scientist who generally is also a middle class person and an obvious outsider. A good example of the falsification of results thus gained was afforded by a factory girl who told the following story: "Some years ago a psychologist came into the factory. He wanted to know about my day dreaming. I did not quite know what to say, so he just told me what I was thinking about when working, and I only had to say yes. I often think of what he has told me, even now. Such a clever man."

This somewhat unexpected effect of scientific research on the behaviour of a working class girl is a far more interesting result than the statistics about day dreams which probably have been established after this sort of application of the method of direct interview.

Although there exist, no doubt, investigations which are free from similar shortcomings, the frequency of the type characterized justifies the undertaking aimed at here, namely, to describe some features in the personality of the factory girl against the background of the social situation. Such a description must necessarily be limited to a selection of features which have been deliberately chosen. It probably includes enumeration of details which seem to be trivial and self-evident; this, unfortunately, is unavoidable when a comprehensive picture is required, where the trivial and the extraordinary, the known and the unknown, constitute together the actual social setting.

II. METHOD

The method used in the study on which this report is based was that which has been termed 'functional penetration'.¹ The investigator worked for several months as a factory worker.² The management of the factory permitted the research project to be carried out; the workers, however, were not informed, in order to keep the situation as unaffected as possible by the observer. After the first month it became advisable to explain the research project to some of the workers. By then, a friendly contact had been established which made them interested in the purpose of the investigation without raising suspicion. Mutual home visits between some of the girls and the investigator supplemented the material.

The material presented here was collected in one factory only; thus it might appear that none of the conclusions can be generalized for other factories. But the problems as presented here are assumed to be universal in factory life, although they may be tackled and solved in different ways elsewhere. A further limitation of this investigation is that the material was collected by one observer only. Friendly criticism on the part of the factory management helped to settle doubtful points. No attempt has been made to distinguish between individual and typical features of this particular factory; such a distinction would not be justified by the present state of research into the problems involved.

III. SOCIAL PATTERNS IN FACTORY LIFE

(a) *The dimensions of the group organization*

Every group organization can exist in two dimensions. There is co-ordination between members of the group, a *horizontal* contact; and a subordination, a social hierarchy, or *vertical* contact. In each of the two dimensions there can be a loose or a close relationship. Each can be accompanied by a positive or a negative attitude, which is, of course, independent of the strength of the relation. Criteria for the strength of the relationship are the frequency of face-to-face contacts, and the frequency of verbal references to a member. The positive or negative

¹ Oeser, O. A. (1937), *Brit. J. Psychol.* xxvii, 343.

As the firm prefers to remain anonymous, no detailed description of it can be given here. A few indications must suffice: The firm employed about 400 workers in that particular factory, the great bulk of whom were women. The work was repetitive, though mitigated by the fact that no brand article was produced. Orders varied in material, size, and colour considerably. I want to take the opportunity here of expressing my warm thanks to the management and the women and girls working in the factory, whose sympathetic attitude made this investigation possible.

attitude is found out by qualitative analysis. The co- or subordination is determined by the function of a member within the group.

This descriptive scheme could be extended further by taking into account the minor divergencies in the vertical dimension amongst group members. The strength and the attitude qualification of the relationship could be described in a less generalized way by introducing more than two degrees. The scheme would thus certainly gain in detail, but it would always remain in the nature of a formal description. From such a description one cannot obtain an answer to the essential question in social psychology, namely, how to understand the origin of this particular type of group relation, and what the resulting influence of the group on the individual may be.

For this purpose less formal features of the situation must be considered, those which actually exist within the formal group structure without being necessary consequences of it. A factory is no logical construction but a social reality. The variety of social relations in it can therefore not be reduced to a simple scheme. The concatenation of various elements in a group situation is a social factor in itself which must not be neglected lest one fails to produce the right picture. Thus, though applying the terminology introduced above, an analysis of the socio-psychological problem of the group situation cannot be restricted to the notions implied by 'horizontal' or 'vertical' contact.

(b) *The horizontal relationship*

The external sign which unites members in the horizontal dimension is the wearing of an overall. The 'headgirls'¹ wear an overall different in colour and cut from those worn by the ordinary workers. This distinction corresponds to different functions, and is meant and understood as a symbol. The power of this symbol was demonstrated by the behaviour of the beginners, who for the first week or so worked in their ordinary clothes; their shyness generally began to disappear on the day they got their overalls. The scrutinies of the other girls then disappeared; the newcomer was adopted into the community.

Besides the uniform dress there is another symbolic expression of equality amongst all members in the horizontal relation: they address each other without exception, without reference to age or sex, by their Christian names. Headgirls are included in this form of address; but foremen are excluded, they are 'Mr X'. The girl of fourteen thus calls men and women by their Christian names who, from their age, might

¹ The term used in this factory for forewomen and women overseers.

be her parents, or even grandparents. Thus she is apparently placed on the same social level with them. This creates an atmosphere of intimacy and cordiality which is essentially different from the social norms prevailing in family, neighbourhood, and friendship contacts outside the factory. This intimate way of addressing each other facilitates conversation, and thus gives the factory girl a unique opportunity of being friendly with persons of various age groups of both sexes, and of participating to a certain degree in their life experience.

These symbolic expressions of the feeling of equality among the factory girls must not be mistaken for the cause of the equality. They only make more obvious a fact which soon becomes known to each worker. The equalizing factor is not their financial situation, which indeed varies considerably between men and women, girls under and above eighteen years, and according to the size and earning power of their families. This equalizing factor is rather the knowledge that they are necessary not as individuals, but only for the performance of a function which almost anybody could fulfil equally well. This is different, of course, for the highly skilled worker, who cannot easily be replaced; he therefore tends to develop a greater personal self-confidence. The factory girl, however, even if she acquires a certain skill, has no illusion about her importance. She knows that she is not needed as a person; therefore she finds it extremely difficult to establish a personal relationship towards her work.

The attitude of solidarity which develops out of this feeling of equality extends even to those who are not liked as individuals. For instance, when one girl who had rather a nervous and queer manner was discharged, obviously because of this manner, all the sympathy was on her side. The same happened in another case, where a girl had been dismissed because of her lack of cleanliness, which had been criticized before by the girls themselves.

The knowledge that one is not necessary tends to decrease the self-respect of every individual who encounters such an experience. This may be compensated by the human contact between those who as a group share this experience; they respect each other.

The piecework system introduces a possibility of breaking up this solidarity. It was much criticized because "it isn't fair", or, as one girl put it, "If one gets more than another, there might be quarrels." In practice, however, this did not happen. The girls, who openly discussed all their purchases with each other, never mentioned their exact wage sum unless it was lower than the average.

This attitude towards piecework should not be taken as a final condemnation by the workers of the piecework system; it is partly an expression of the universal pleasure in grumbling. In a work scheme for unemployed miners in South Wales which I studied, the opposite attitude was met with. The miners were used to the piecework system, and were made to work on a scheme by which they benefited according to their needs, and not according to their work. The predominant opinion amongst the unemployed was that the system was not just. Thus the attitude towards piecework is highly complicated.

The factory girls who benefited from the piecework system remarked in more than one case that they had a bad conscience because of this. On the other hand, a good piecework result tends to increase self-respect. Whilst a bad result was invariably attributed to bad luck or unfair treatment, a good result was generally attributed to one's own good working capacity. Solidarity on the one hand, and the desire for acknowledgement of individual achievement on the other are thus in a conflict. The girls are conscious of this and often discussed it.

Membership of trade unions is the organized expression of the feeling of solidarity. As everywhere else, the percentage of girls in the trade unions was lower than that of the men. The reports of difficulties in canvassing illustrate the fundamentally different outlook towards work between the two sexes. The girls do not join because "they do not bother" or because, as they say, "I can do better with my 6d." Whilst the man has accepted work as a part of his life, 'real life' for the factory girl starts with the moment she leaves the factory at the end of the day. Although she might be willing to prove her solidarity in every concrete situation, she refuses to look farther than that. Her ambition and her dreams belong to a different sphere. It is significant that most of the girls did not know which of them belonged to a trade union. Thus, this factor has no influence on the general harmony of the horizontal contact.

Throughout the factory the equal value of each individual belonging to the horizontal dimension, irrespective of age, sex, family situation, wage difference, and even skill, was fully recognized. The relationship is thus 'equalitarian'.

(c) *The vertical relationship*

(1) *Relation to foremen and headgirls.* The foremen and headgirls in a factory are financially privileged. This difference, however, does not affect the mutual attitude; the amount of the wage difference is unknown to most of the girls. Besides, a headgirl receives no more than many a

man who is included in the horizontal contact, whilst she is excluded. The decisive distinction lies in their function. Headgirls and foremen know that it is not easy to replace them, that the smooth running of the factory organization depends to a large degree on their presence, experience, and organizing capacity. This naturally not only increases their self-esteem, but also induces them to look down on those whose work is of a less individual character. "I don't think anybody could take my place now" was a typical remark of a headgirl.

Foremen and headgirls show an attitude of interest towards their own work, which distinguishes them clearly from the predominant attitude of lack of interest in work shown by unskilled workers. The problem of boredom does not arise to the same degree for them. The influence of this fact on the harmony and unity of their personalities is undoubtedly great, yet difficult to prove. A few examples which seem typical of the 'foreman's way of thinking' may tentatively indicate in what direction the difference lies:

A foreman, in explaining a new type of work with the help of a paper model, discovered on this model the words 'marque déposée'. He read them aloud, and commented: "This is French. Once I was in France. Those French people are different from us..." (and went on speaking about his experiences in France).

A foreman listened to another man's profoundly moving tale connected with a picture post card found during the last war on a battlefield; whilst the others were only interested in the emotional side of the story, he investigated print and material of the picture post card: "A good piece of work, the Germans have always been good in printing", he said.

A foreman mislaid an order sheet, needed by a worker: "Where can it be?" he said, "I hate losing anything. There are always troubles then. Once I mislaid my key at home..." (followed by a story of what happened).

The common feature of these incidents is that a generalized thought was provoked in connexion with work. Associations were stimulated by an incident, and connected work with life in general, or vice versa. This process, the combination of life and work in one chain of associations, is, of course, not proved by a few examples. But judging from the general outlook of unskilled workers and foremen, it seems to be the most essential difference in their respective attitudes and personalities.

The attitude of the girls towards their work as regards the interest it arouses may be illustrated by the following observation:

A group of eleven girls who were working for ten days on a special order concerned with an advertisement, were asked afterwards whether they knew what was

advertised on each of the many thousand objects they had been handling. None of them knew.

This again is only an illustration of the effect of mechanical mass production on the personality. It results in an almost complete split between work and life. The head does not know what the hands are doing; at least, one part of the mind is excluded from participation in the working process. The other part has to control and check an almost but not completely automatic activity. This justifies the assumption that there are two parallel but unconnected levels of thought. Further investigation would be necessary to verify the implied conclusions as to a split in the personality.

The difference in the function and outlook of the girls as compared with that of foremen and headgirls, leads us to expect a difficulty in their understanding of each other. This expectation is fully justified by observation; the attitude in the factory was one of mutual resentment, and sometimes hatred. The foreman's attitude to the worker varies naturally with the personality of the foreman. It is possible that some personalities may succeed in bridging or at least disguising the fundamental conflict between the two groups. But the foreman and headgirl are generally excluded from the cheerful 'good morning' and 'good night' wishes. Neither of the two parties takes any care to disguise their feelings towards each other. The situation is made more difficult through the closeness of the daily contact and through the fact that some of those who are now foremen or headgirls in charge of the others used to work formerly as ordinary employees in the same factory. Many remarks and incidents showed clearly that the girls have much less objection to an authority which comes from a different social class. In some cases the bad manners and bad language used by individual foremen afforded a good excuse for the rationalization of the hostile attitudes of the girls. On the whole, however, it seemed to be more the difference in outlook and function than the faults of individuals which gave rise to many complaints, amongst which favouritism, having to wait for work, and general lack of consideration, were predominant.

Thus, the relation between the girls and those workers put in charge of them showed the following features: resentment, lack of mutual understanding, a feeling of superiority on the one side, of inferiority on the other. The actual power of those in charge is great. The girls depend on the foreman's decision and likes, and there is no attempt to explain or to understand such decisions. Although the labour management and the trade unions are supposed to act as a court of appeal, practically no

use is made of that possibility. The relationship appears to be 'dictatorial'.¹

(2) *Relation to the management.* The relationship of the girls to the management is much looser than those previously discussed. But apart from the loose actual face-to-face contact there exists, of course, a relation in thought, based on the knowledge of dependence and of the superior social position of the executives of a firm. It seems that the attitude of the girls towards the management is ambivalent; they possess two sets of attitudes, even two forms of language, where the management is concerned. Talking about a concrete situation they refer to the management always by their proper names; talking about the management in a more general fashion, names are never mentioned. The vague form 'they' is then used. The first type of language is chiefly combined with a positive, the second with a more critical attitude. Reference in this second form is rare, however, and occurs only in the infrequent conversations about trade unionism or working conditions. Such conversations reveal a stereotyped attitude towards employers in general: antagonism between the interests of the workers and the employer is unquestioned, trades unionism is the only conceivable means of help in this conflict, and on the whole a successful means. The continental observer is struck by the lack of political slogans in such talks.

The attitude of the girls based on concrete experiences with their own management is entirely free from the resentment expressed in the theoretical sphere. This is partly due to the fact that the particular management was actually very considerate, and partly to the fact that the girls have a deep respect and admiration for the social class to which the representatives of the management belong. The contrast in manners between foremen and executives increases this respect considerably. The foremen are not gentlemen, but the managers are.

The girls in describing their attitude towards representatives of the management used the term 'gentleman' frequently, thus revealing the nature of the relation to the management. It is a 'patriarchal' relation; unquestioned authority, feelings of respect and admiration, appreciation of the personal contact, are its predominant features. The ambivalence and latent rebellion against it are less obvious here, but not uncommon in other decaying patriarchal relations.

¹ The view of the management of the factory diverges here from that of the investigator. They are of the opinion that the attitude of the girls towards foreman and headgirl is not a result of their different functions, but only of the particular personalities observed. They further maintain that the actual power of the foreman over the girls is too limited to justify the term 'dictatorial relation'.

IV. THE TIME EXPERIENCE OF FACTORY GIRLS

Some evidence has been collected about the frequency and type of manifestation of boredom. As Wyatt's and Langdon's study, quoted above (footnote, p. 191), gives a detailed account of it, only a short summary will be given here. The experiences of boredom and fatigue are entirely different. Boredom was a constant problem for most of the girls throughout their working week; fatigue was hardly mentioned under normal conditions, and became a subject of discussion only when the factory worked overtime.

The attitude towards overtime illustrates best the difference between the experiences of boredom and fatigue. The actual overtime period lasted for an hour and a half, four times a week. It was preceded by half an hour in the canteen for tea, and followed by going home. The girls complained about it because—as they said—fatigue prevented them from making this time pay satisfactorily (they worked under piecework conditions). Asked about their time experience, however, they unanimously declared that it was highly positive. "It passed so quick, like nothing"; "just like lightning it was, not more"; "passes so lovely, was over before it had really begun", etc., were typical remarks.

Boredom thus does not seem to be in proportion to fatigue, but rather to depend on the length of the working spell. The normal working spell was over four hours, without any interruption. Boredom is experienced when the present has no value of its own, and does not demand the full mental, emotional, and physical energies of the individual, the typical state for a worker on repetitive work. The present, however, is a relative notion; it comprises a time interval that can be easily conceived of as a unit. It is well known that the beginning and the ending of a time spell are clearly marked and distinguished in their psychological significance from the time in between. How long this starting and ending effect lasts, is difficult to ascertain. In the case of the factory girls on overtime, however, it was clear that these effects helped to reduce to next to nothing the boring interval in between the two marked points. A similar effect was produced when a group of girls had one day to report their output hour by hour to the headgirl, in order to ascertain piecework rates. This morning was again felt to be completely free from boredom.

Another means of overcoming boredom is, of course, to make the present a vital experience; this possibility is necessarily very limited for factory workers on repetitive work. It could be observed, however, when girls started a new job or had to learn a new manipulation. Two girls

were observed who were being put on a more difficult job for the first time. They had to perform a motion consisting of nine consecutive movements which demanded a certain skill. They had received careful instructions beforehand. They worked at it with keen interest, and did not listen to other girls talking to them; the others watched them with interest and envy; everybody would have liked to do this.

The general longing to work at short instead of at long orders is again to be understood as an attempt to avoid boredom. Some of the most often repeated remarks between the girls were: "How does the time pass for you to-day?" "How does the time pass at this job?" "The time does pass slowly to-day." "The time passes like nothing to me this morning." The latter remark being, of course, less frequent.

The prolonged experience of trying to pass the best part of the day as quickly as possible made the girls invent a number of clever dodges to facilitate this effort. In one room, for instance, the observer was severely criticized for looking at the watch at 8.30 a.m. "If you start to look at the time at this hour, it won't pass for you at all. We never look before we think it is 11 a.m. Then you are often surprised to find that it is already 11.30. And from there to lunch time is no time at all. In the afternoon you may look when it is 3 p.m. or so."

Other means of escaping boredom were eating sweets, and general restlessness. Sweets were either brought by one or the other of the girls and offered to her immediate neighbours, or—what happened more frequently—were bought during the afternoon in the factory. This involved one girl getting pennies from the others secretly without the foreman or any other person in charge being able to see what was going on; going over to the canteen or to a girl in another department who maintained a secret trade in sweets; in both cases pretending to fetch new material or being sent for an errand; coming back and distributing the purchases secretly; offering them to one another and then sucking them with great satisfaction. This process, thrilling in itself even apart from the actual treat, was generally initiated by one girl, discussed, first rejected, then taken up and carried through. On twenty-five consecutive working days this escape from boredom was adopted eighteen times; three times in the morning between 10 and 11 a.m., fifteen times in the afternoon between 2 and 4.30 p.m.

The capacity for finding an active escape from boredom seems to be in an inverted relation to age. The older girls reacted by becoming depressed and quiet. That this was due to boredom could only be ascertained by verbal statement.

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A few observations of behaviour and a number of remarks may illustrate what has been said:

After 3 p.m.: Everybody, especially the youngsters (14-16 years of age) are tired and bored. Every 5 min. somebody looks at the clock. Work seems to slow down. Two girls get up from their stools and put them in a slightly changed position. There is general restlessness. At 4 p.m. a mouse runs through the room. All the girls squeak, and show fear and disgust. A lad of about 15 catches the mouse, and is very much admired by the girls. After this incident talking goes on, and the nervous restlessness is replaced by a cheerful atmosphere. Later on there is singing—"Down Mexico Way".

This incident shows the importance of something happening unexpectedly. "I wish something would happen" was one of the most frequent remarks during the first part of the afternoon. After the war had started, the younger girls would say: "I wish there were an air-raid, now!" An older girl modified this remark in saying: "I wish there were an air-raid warning."

Another example: A girl of 22 years of age says about 3 p.m.: "I am fed up, I should like to do something exciting. I am bored stiff and I can't stand it any longer." She starts to play about with the working materials, and throws them about. After a while she collects them again and goes on working regularly. At 5.15 p.m. she goes to the lavatory, and comes back beautifully painted, and with more lipstick on. At 5.25 p.m., 5 min. before the end of the working day, she starts to work again at full speed. Everybody laughs at her. She says: "That is because I am a conscientious worker." To me she adds amidst laughter: "It is only to pass away the last minutes quicker."

Another difference between the time experience of younger and older girls is that the former are concerned with the day only, whilst the latter think of the hours of boredom, of the same kind experienced in the past and the inescapable future. In such a mood they would say something like, "Day after day, year in year out, always the same." This general depression was expressed by one woman of about 40 years at 3.30 p.m. in this way: "I am weary, I don't know why. I would like just to sit down and not move for hours." At such a moment remarks about what they would rather have done than be a factory girl were frequent. But the 15-year-old girl when bored looks at the clock and finds that it is only 2.15 p.m., and expresses what she wants by just saying: "I wish it were 5.15 p.m."

It happens occasionally also, of course, that girls have the other experience, e.g. when one girl looks at the clock at 4.20 p.m. and says: "Oh, I thought it was only 2.20. I have worked so hard that the time

passed quickly." This was, however, the only remark of its kind heard from a girl not on piecework.

While the young ones begin at 9.15 a.m. to say "the time is going slowly to-day", the older girls seem to have made their peace with the mornings, and only complain about the afternoons. This may also be due to the fact that the normal routine of a factory day gives more variety in the mornings.

The time experience is, however, very much modified under the influence of piecework. A number of girls on piecework had been observed working during the last quarter of an hour of the lunch pause. Remarks like the following were heard not infrequently; "Oh, I am never bored, and time is never too long. I am on piecework, and that makes the time pass frightfully quickly."

Arguments against piecework have already been mentioned, but there seems to be general consent amongst the girls that the good side of piecework is that one does not notice so much how the time passes. What happens on piecework is that the girls start to measure time in money, or even in pairs of silk stockings, or visits to the pictures. This naturally involves no more counting the minutes, but taking hours or even days as time units. Although not all of them are fortunate enough to take small luxuries as the means by which to measure time under piecework conditions, they all work under a pressure which makes them less sensitive towards the boring effect of repetitive work. They have to do a certain amount to earn their normal living, and they often find that they cannot achieve this. Comparison with the output of the others also functions as a stimulus on piecework. In this connexion it is interesting to note that the time experiences of those who are excellent pieceworkers and are generally above the average are much more similar to those of day workers than to those of slow pieceworkers.

V. SOCIAL CONDITIONING OF THE PERSONALITY OF THE FACTORY GIRL

The school leaver who starts factory work has been equipped in school with certain standards of value. She is taught that it is desirable to be industrious and to excel others in achievement and in intelligence; also to keep a certain distance from, and to show respect to, every grown-up person. Care for one's own personal appearance is allowed in so far as it is limited to cleanliness and tidiness; anything else, such as making oneself more attractive or using cosmetics, is prohibited. This scale of values is turned upside down in the factory. To be too industrious

and to excel the others in achievement makes one suspect to the other workers in the factory; to be clever is obviously of no use here. To respect age instead of function is out of place. To care for one's appearance is of the utmost importance, in order to succeed in the factory atmosphere.

These conflicting value standards are neither explained nor even openly discussed. Those who observe well and adjust quickly escape being laughed at; but scarcely anyone escapes feeling bewildered. None of the girls who were asked how they felt about addressing everybody by his or her Christian name, had been free from embarrassment in the beginning. One girl spoilt her whole career by addressing a forewoman as 'madam'. This conspicuous experience is followed by many more subtle ones. The girls have to learn the norms and rules of their new social sphere; the method of learning is imitation. As the girls are too young to distinguish between the important and the non-important, they imitate everything. To be kept an outsider is the only and very effective punishment for those who do not succeed quickly in the process of adjustment.

This imitation covers every possible shade of behaviour in the factory; it is made easy through the great number of living examples, and is made urgent through the menace of remaining an outsider. The most noticeable effect is the adjustment of the outer appearance after a couple of weeks. Lipstick, rouge, and powder are commonly used from the early morning onwards; waves and curls become obligatory. This is considered to be not only necessary for improving the appearance, but also as an expression for a certain 'savoir faire'. These and other small luxuries—the ration book holder, the gas mask cover, rings, ribbons, and so on—are not only enjoyable in themselves but they are part of the norm that has to be adopted. The greater their amount and variety, the higher is the social prestige of a girl. This standard is irrespective of the girl's economic situation, which varies enormously according to the number of members of the family in work.

It is equally important for the girl's prestige to have a 'young man'. To a certain extent his existence means a relief of the strain on the weekly budget of the factory girl. But to say so, or for that matter, to think so, would make a girl completely impossible. Perhaps in no other sphere of life is the behaviour of the factory girl more strictly regulated by her highest ideal, respectability, than in her relations to her boy friends. The social significance of marriage is still higher for the working class girl than for the middle class girl. The expectation of marrying at latest in her twenties is part and parcel of the outlook of a factory girl; she is very conscious of the fact that this is her only means of escape from the

routine and monotony of work. The romantic notion of love is reserved for the engagement period. Before reaching this state the girls dream of romance, stimulated by films and fiction, but have matter-of-fact attitudes towards their boy friends. An extreme case of this matter-of-fact outlook was shown by a girl of eighteen who said: "I have four boy friends, one in the Navy, one in the Army, one in an ammunition factory in W., and one in this town. I think it is wise in these days to have more than one boy, one never knows what is going to happen to them."

Uniformity of outlook is further achieved in the literary taste of the girls, and their attitude towards current events. In this latter respect the terminology they use is borrowed from the headlines of the most frequently read newspaper, the *Daily Mirror*. The influence of wireless and newspaper headlines on the girls can hardly be over-estimated. It was noticed again and again that the girls repeated verbatim in their conversations phrases from the B.B.C. news bulletins or headlines from their papers, without being conscious of quoting somebody else's expressions.

The outstanding feature of this description is the tendency of the factory girl to conform to type and not to be conspicuously different from the others. This 'ideal type' of factory girl has, however, one quality to which a special group cannot conform; that is, age. The ideal type must be under thirty years of age. The girls above this limit who have not achieved marriage are faced with a serious conflict. The individual understands that being more than thirty years old, she has to pretend not to mind, to carry on hopefully, to keep up appearances and spirits. This she may manage for the next ten years or so; but from then on she finds it increasingly difficult. Her own family is normally dissolved, or at least is living on Old Age Pensions. The small luxuries can be maintained only by considerable effort, but they look more shabby and out of place. Every year carries them farther away from the 'ideal type', and makes it harder to maintain self-respect. They begin to wonder about the sense of life. One example may be quoted: "Sometimes I think my life has been a waste. You know what I would have liked to be: to be somebody of whom notice is taken. Sort of 'here she comes', people ought to say wherever I go. Then I would have felt that life has some sense. Often when I am in bed now in the evening I say to myself: if it weren't for my old parents, I wouldn't mind being dead."

The problem of the unmarried older woman exists, of course, in every social sphere. But it is especially difficult to solve for the factory girl who has lived under the pressure of a social atmosphere which has no room

for old women. Such compensations for this type of disappointment as are afforded by life and work get fewer with increasing age. Those who are definitely old and have resigned themselves to that stage of life tend to be isolated in the factory. The years preceding such resignation are the most difficult and pathetic ones for the female industrial worker. As long as she can deceive the others, she can deceive herself; therefore an ever-increasing attention is paid to appearance. In this brave struggle not to give in, the knowledge of other people's troubles seems to be a great comfort. In no other age group was found so great an interest, and sense of tragedy, in life. To assume that social contacts outside the factory and hobbies of various kinds are an effective help at this stage, would be to make a mistake of such a kind as the assumption that the unemployed man can make good use of his enforced leisure time. When the vital needs of an individual are left unsatisfied, not much energy seems to remain for substituting compensations.

VI. SUMMARY

Three psychological problems of factory life have been discussed. These problems must necessarily exist in every factory; the special form described here concerns one factory only, and cannot yet be generalized.

(1) The social relationships in the horizontal dimension is 'equalitarian'; the vertical relationship between workers and foremen and headgirls is 'dictatorial'; the vertical relationship between the workers and the management is 'patriarchal', and also ambivalent.

(2) The predominant experience of the factory girl on repetitive work is boredom. Boredom and fatigue are experienced as entirely different phenomena. The time experience is chiefly dependent on the length of the uninterrupted working spell.

(3) The standards of value of school life are entirely different from those in the factory. The pressure of social norms in the factory is strong, and compels the girls to imitate each other. This imitation results in producing a type and hinders the development of individuality. The lack of equally strong sets of norms for the older woman in the factory makes her adjustment subjectively difficult, and prevents her from leading a normal life inside the factory atmosphere.

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THE INFLUENCE OF THE WILL TO SUCCEED ON THE PERFORMANCE IN GROUP- GIVEN MENTAL TESTS¹

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I. INTRODUCTION

IN the *British Journal of Psychology* (1936, xxvii, 119-25), a list of suggestions for future investigations in the field of vocational guidance was submitted under the heading: "A programme of desirable investigations on the topic of vocational guidance." Among the subjects suggested for study, there appeared the following: "A study of the 'will-to-succeed' in group-given tests would be valuable" (p. 123). This study was carried out in an attempt to measure the influence of the 'will-to-succeed' on the performance in group-given mental tests.

¹ Part of a thesis accepted for the M.Sc. degree of the University of South Africa.
Brit. J. Psychol. xxxi, 3

II. OUTLINE OF THE INVESTIGATION

In this investigation a battery of tests, measuring a variety of functions, was drawn up. These tests, as well as an intelligence test, were then given to the subjects. On the basis of the intelligence test scores and on the basis of the scores obtained in these tests, the subjects were divided into two equal groups. One group, the non-incentive group, was now used as the control group, and was retested under the same conditions. To the other group, the incentive group, an incentive was given on the re-testing. The results obtained were statistically treated to find if the incentive influenced the performance.

III. SUBJECTS AND TESTS USED

(1) *Subjects*

The subjects in this investigation were students, mostly undergraduates of the Rhodes University College, Grahamstown, South Africa. About sixty-five students took these tests, all voluntarily, but as some missed some of the tests, the results of only fifty-six students could be used.

(2) *The tests*

The tests used were selected so as to measure a variety of functions, e.g. perceptual-motor functions, memory span, learning, etc. The tests were obtained from the selection used in the Psychology Laboratory of the Rhodes University College, and also from the works of Hull⁽⁵⁾ and Whipple⁽⁹⁾.

The following are the tests that were used:

Test I. Memory span for digits. In this test twenty-one series of digits were read out to the subjects, and after each series had been read, the subjects were required to reproduce the series. The digits were read in time with a silent metronome at the rate of about a digit per second. There were three series of four digits each, three series of five digits each, etc., up to three series of ten digits each. Care was taken to avoid combinations of digits which could result in any undue facilitation in the retention of the series of digits.

Test II. Memory of design (see Hull⁽⁵⁾, pp. 326-8). In this test, a number of designs, such as those shown in Fig. 1, were drawn on a large card. This card was then exposed to the subjects for 30 sec., after which they were required to reproduce the designs.

Test III. Manual operations. This test was introduced in an attempt to measure a subject's eye and hand co-ordination. The material of the test consisted of rows of small circles—O's as made by a typewriter, e.g. 00000 00000 00000 00000. The O's in the successive rows were arranged in groups of 5, 6, 7 and 8. The subjects were required

to work along these rows and to place a pencil mark in each circle. The subjects had to work as fast as they could, and yet had to make sure of placing a mark in each circle. Two minutes were allowed for the test.

Test IV. Number series test. In this test, series of numbers in arithmetical and geometrical progression, or in a combination of these, were drawn up. In each series two numbers were left out and the subjects were required to fill in these omissions, e.g. 10 1 8 1 .. 1 4 .. . Five minutes were allowed for the test.

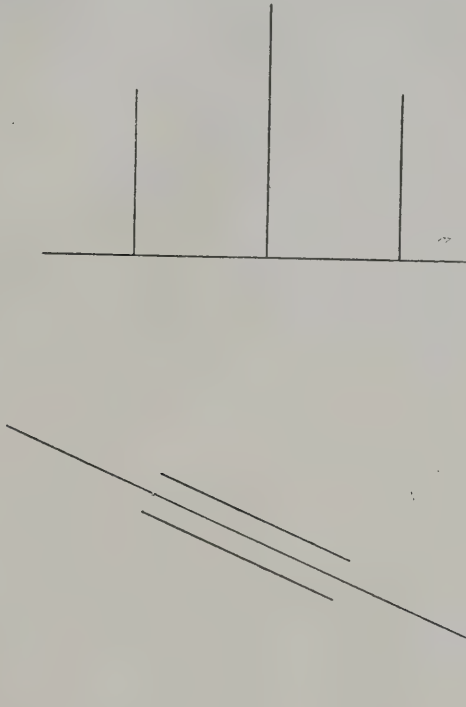


Fig. 1.

Test V. Instructions test (see Wild(10), p. 333). This test, as well as Test VI, were the same as those used by Wild. The material of this test was made up of twelve short paragraphs; e.g. "If the fourth word to the right of the second word in this sentence has more letters than the thirteenth word in the sentence, write 'less' here....." The execution of these instructions demanded the educing of certain relations. The marks for each paragraph were allotted on the basis of the difficulty and the number of major relation eductions involved in each problem.

Test VI. Cancellation test (see Wild(10), p. 334). The material for this test was made up of rows of letters typed in groups of four; e.g. *hyff trgg yyrd dtte øtrf tælg gynð deeg*. The subjects were required to cross out pairs of letters, subject to certain stated conditions, viz. *pairs* of d's had to be crossed out when the next *pair* of letters was a pair of e's, a pair of e's had to be crossed out when the next pair of letters was

a pair of f's, and a pair of f's had to be crossed out when the next pair of letters was a pair of g's. In scoring, deductions were made for omissions and faulty cancellations. The time limit was seven minutes.

Test VII. Filing test, an adaptation of test 6 (b) of the National Institute of Industrial Psychology—Clerical Tests—Series 25. In this test an alphabetical list of nonsense words was supplied. With this list there was also supplied a smaller list of nonsense words. The subjects were required to find where each word of the smaller list fitted alphabetically into the longer alphabetical list. On the retesting, for both incentive and non-incentive groups, the smaller list of words in the test was changed. This was done so as to eliminate any facilitation of the work in the retesting which could have resulted from the retention of spatial relations educed during the first test. The subjects were allowed three minutes for the test.

Test VIII. Digit symbol test (see Whipple(9), pp. 499–516, Substitution Test, Test B). In this test the numbers 1–9 were each supplied with a given symbol. Below these appeared two columns of numbers and the correct symbol had to be substituted for each digit in the number. The execution of this test is dependent upon the quickness of perception and the successful formation of associations. Four minutes were allowed for the test.

Test IX. Adding test. For this test, use was made of the Kraepelin's Adding Sheets. These sheets contain columns of digits and in our experiment these digits had to be added, four at a time, down the column. Ten minutes were allowed for the test.

IV. ADMINISTRATION OF TESTS

(1) *Instructions.* Each subject was supplied with a set of nine tests fastened together.

The instructions for each test were printed on the separate test sheets, at the bottom of the previous test page, thus preventing any subjects from starting on a test before the instruction to start was given. In the case of tests VIII and IX, however, the instructions were given orally.

Before a testing was started, some general standardized instructions were given, and these were repeated exactly at subsequent testings. Before each individual test was started, the instructions for that test were read over with the class.

(2) *The first testing.* All the students were simply asked to do the tests, without any emphasis being placed on working hard or fast, etc. For convenience the subjects were taken in two groups, the respective groups being tested on two successive days. The test conditions were kept constant on the two successive days. All subjects were also given the National Institute of Industrial Psychology Intelligence Test, Series 33.

(3) *Division into equal groups.* On the basis of the scores obtained on the intelligence test and on the battery of nine tests, the subjects had now to be divided into two equal groups.

As the scores of the nine tests, as well as the scores on the intelligence test, had to be taken into account, it was obviously impossible to obtain two groups which were equal with respect to all the tests. Moreover, the fact that some of the subjects could only attend the tests on certain afternoons had also to be taken into consideration. Table I, however, shows that the two groups were roughly equal. In the table are shown the average scores obtained by the groups on the first testing. The one group was to be used as a non-incentive and the other as an incentive group.

Table I

Test	Non-incentive group		Incentive group	
	Average score	σ	Average score	σ
I	12.25	3.3	12.0	2.9
II	20.6	3.0	20.5	3.9
III	260.1	44.4	263.6	30.1
IV	22.6	7.7	24.5	9.6
V	20.4	6.9	20.8	8.5
VI	46.5	14.5	46.5	17.7
VII	14.0	4.0	14.3	3.6
VIII	133.5	18.4	138.2	24.2
IX	119.5	39.2	123.5	37.3
Intelligence test	146.5	18.0	149.7	15.6

(4) *Re-testing.* After the subjects had been divided into the two groups, both groups were re-tested. This was done about a month after the first testing and also on consecutive days. This ensured an approximately equal lapse of time between the two testings for all the subjects.

On the re-testing, the non-incentive group, which was used as the control group, repeated the tests under conditions identical with those under which the first testing was carried out. No indication was given to them at any time that the experiment was concerned with incentives, nor were they told that the other group would be given any special incentive. Further, the non-incentive group could not have been influenced by any discussion with the members of the incentive group, because the incentive group was re-tested after the non-incentive group.

For the incentive group the re-testing was done under the same conditions, except for the fact that an extra incentive, urging them to improve on their previous performances, was given.

(5) *The incentive used with the incentive group.* The incentives that are used in investigations of a comparable type are many and varied. Among the incentives commonly used may be mentioned the following: group and individual rivalry; praise and reproof; prizes (monetary or otherwise); personal appeal, etc.

Since we were interested in the “*will to succeed*”, it was decided to find out what effect would be produced by an appeal to the incentive group to assist and co-operate in the investigation. When this group was re-tested, the aim of the research was explained to the subjects and they were asked to make a special attempt to improve on their previous performances and so to do better than the other group. (The rivalry motive was not, however, emphasized.) Moreover, the Head of the Psychology Department, Dr Wild, addressed the subjects and encouraged them to better their previous scores. This appeal was made very strongly, and was repeated at intervals between the tests. This kind of personal appeal is an incentive commonly met with in school, home and psychological test situations, and we wished to know what was the effect of such an incentive on performances of various kinds.

V. RESULTS

(1) *Reliability of tests*

Since the non-incentive group carried out the first testing and the re-testing under the same conditions, the coefficients of correlation for these two sets of scores should supply a measure of the reliability of the tests. Table II gives the coefficients of correlation and the probable errors obtained for the nine tests, using the formula

$$r = \frac{\Sigma (xy)}{N\sigma_x\sigma_y}; \quad \text{P.E.} = \frac{0.6745 (1-r^2)}{\sqrt{N}}.$$

The coefficients of correlation are all fairly high. Though the number of cases used is rather small, viz. twenty-eight students in the non-incentive group, these tests may be regarded as reasonably reliable.

Table II

Test	Coefficient of correlation	Probable error
I	0.82	0.04
II	0.67	0.07
III	0.83	0.04
IV	0.83	0.04
V	0.78	0.05
VI	0.89	0.03
VII	0.79	0.05
VIII	0.95	0.01
IX	0.94	0.02

(2) *Variability of scores*

Investigations in this field have shown that the introduction of a strong incentive to the test situation very often influences the variability of the scores obtained. Thus Maller & Zubin (7) found a greater variability of scores under incentive conditions. Benton (1), however, found that both his groups gained somewhat in scores on the re-test, but that there was a small decrease in variability. Burns (4) again states that the effect of motivation on variability is not constant, but varies with the function studied.

Table III. *Standard deviations*

Test	Non-incentive group			Incentive group		
	First testing	Re-testing	% increase	First testing	Re-testing	% increase
I	3.3	3.8	+17.4	2.9	3.0	+ 5.2
II	3.0	2.7	- 9.0	3.9	3.0	-21.7
III	44.4	48.2	+ 8.5	30.1	42.9	+42.8
IV	7.7	10.0	+30.6	9.6	9.6	0
V	6.9	9.0	+30.8	8.5	7.8	- 8.6
VI	14.5	15.4	+ 6.4	17.7	19.3	+ 9.2
VII	4.0	3.3	-17.7	3.6	3.4	- 7.2
VIII	18.4	22.8	+23.8	24.2	21.0	-13.5
IX	39.2	46.5	+18.9	37.3	39.4	+ 5.6

Table III shows for the present investigation the standard deviations of the scores obtained in the first testing and the re-testing, and the percentage increases in the standard deviations in the re-testing, for both the incentive and the non-incentive groups.

An inspection of Table III shows that for the non-incentive group the variability, as shown by the standard deviations, increased in the re-testing as compared to the first testing in seven of the nine tests; whereas in the case of the incentive group, there was an increase in only four out of the nine cases. Further, the variability decreased in two cases (tests II and VII) for the non-incentive group, but in five cases (tests II, IV, V, VII and VIII) for the incentive group. These results thus suggest a decrease in variability under incentive conditions as compared to normal conditions.

(3) *Did the incentive influence performance?*

The effect of the introduction of an incentive on the performances in these tests was measured in the following way. Consider the results obtained for test I by the subjects of the non-incentive group. Two sets of scores were available, those of the first testing and those of the re-

testing. The value of $\frac{M_2 - M_1}{P.E. M_2 - M_1}$ was now calculated from these two sets of scores. If the value of $\frac{M_2 - M_1}{P.E. M_2 - M_1}$ was found to be greater than 4, it was assumed that a significant difference existed between these two sets of scores. Similarly, it was found whether a significant difference existed between the scores obtained on the first testing and on the re-testing for test I in the incentive group. If no significant difference existed between the two sets of scores for test I of the non-incentive group, effects due to repetition could be discounted; so that if a significant difference was found between the two sets of scores for test I of the incentive group, it could be attributed to the extra incentive.

These calculations were made for each of the nine tests and for each of the two groups. The results are shown in Tables IV and V.

Table IV. *Non-incentive group*

Test	First testing		Re-testing		$M_2 - M_1$	$\frac{M_2 - M_1}{P.E. M_2 - M_1}$
	M_1	σ_1	M_2	σ_2		
I	12.3	3.3	13.1	3.8	0.8	1.39
II	20.6	3.0	21.8	2.7	1.2	2.32
III	260.1	44.4	278.6	48.2	18.5	2.22
IV	22.6	7.7	26.8	10.0	4.2	2.62
V	20.4	6.9	27.9	9.0	7.5	5.21
VI	46.5	14.5	60.9	15.4	14.4	5.35
VII	14.0	4.0	13.5	3.3	-0.5	-0.76
VIII	133.5	18.4	137.9	22.8	4.4	1.18
IX	119.2	39.2	135.1	46.5	15.9	2.06

Table V. *Incentive group*

Test	First testing		Re-testing		$M_2 - M_1$	$\frac{M_2 - M_1}{P.E. M_2 - M_1}$
	M_1	σ_1	M_2	σ_2		
I	12.0	2.9	13.8	3.0	1.8	3.40
II	20.5	3.9	21.8	3.0	1.3	2.08
III	263.6	30.1	278.0	42.9	14.4	2.16
IV	24.5	9.6	28.5	9.6	4.0	2.33
V	20.8	8.5	27.6	7.8	6.8	4.65
VI	46.5	17.7	61.9	19.3	15.4	4.63
VII	14.3	3.6	14.8	3.4	0.5	0.80
VIII	138.2	24.2	151.1	21.0	12.9	3.17
IX	123.5	37.3	145.8	39.4	22.3	3.24

An inspection of Tables IV and V shows that with one exception (test VII, non-incentive group) the repetition of these tests caused an increase in score under both normal and incentive conditions, but the increases were mostly small, and in only two cases, tests V and VI, were the increases large enough to show significant differences. For tests V and VI, however, although significant differences were found between

the results of the first testing and the re-testing, these differences were found in the non-incentive group as well as in the incentive group. These increases can thus not be ascribed to the influence of the incentive, but were probably due to practice.

In the cases of tests I, VIII and IX a greater improvement was found on re-testing under incentive than on re-testing under non-incentive conditions, but the differences are not significant.

VI. CONCLUSION

In this study a set of nine tests was administered to fifty-six students. On the basis of their scores on these tests, and on an intelligence test, these subjects were divided into two equal groups which were then re-tested; one group under conditions identical with those under which the first testing was carried out, the other group under very strong incentive conditions.

It was found that the repetition of these tests caused an increase in scores under both normal and incentive conditions. In only two cases were the increases large enough to result in significant differences, and in no case did the incentive group show a significant increase in score over and above corresponding increases for the non-incentive group.

Thus we have not demonstrated any significant improvement in any of the tests due to the introduction of an incentive involving appeal, encouragement, suggestion and exhortation.

This may be due to the following causes:

(a) The ordinary conditions under which mental tests are performed are such as to stimulate the subjects into trying their hardest on the first testing.

(b) Improvement in re-tests may vary so much with individuals as to cancel out effects on the group as a whole. Thus Bradford⁽³⁾ found that the amount of improvement in re-tests varies considerably among individuals. McKinney⁽⁸⁾ discovered individual differences in the susceptibility of his subjects to his suggestion. Book & Norvell⁽²⁾ conclude that "incentives influenced men more than women, the intelligent more than the average". Miss Hurlock⁽⁶⁾ concludes that "older children respond more to both praise and reproof than do younger ones".

(c) Improvement in the re-tests may vary with the type of test. If this was the case, it would not be possible to generalize on the influence of incentives. Thus Maller & Zubin⁽⁷⁾ obtained different results in their subtests. In some cases they found an increase on the re-test, in others a decrease. Burns⁽⁴⁾ found that results vary with the function studied.

(d) The incentive used may in fact not be strong enough to produce any improvement in performance.

If, now, the above considerations are valid, then the influence of incentives on the performance in mental tests seems to be dependent on

(a) The individual subject.

(b) The type of test.

(c) The strength of the incentive.

Hence, any extensive investigation directed to measuring the influence of incentives should take account of individual differences, of different ages, and use a great variety of tests and a great variety of incentives, if the problem of the influence of incentives is to be adequately dealt with.

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A RESEARCH IN COLOUR PREJUDICE

By S. P. ADINARAYANIAH

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- II. *Aim of the present research* (pp. 218-219).
- III. *The questionnaires* (pp. 219-222).
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- V. *Results* (pp. 222-224).
- VI. *Conclusions* (pp. 224-228).
- Acknowledgements* (p. 228).
- References* (pp. 228-229).

I. INTRODUCTION

COLOUR prejudice is an important factor operative in the social relations of the peoples of many countries, and as such demands the careful attention of the social psychologist. It has been a perennial problem in the United States of America and in British South Africa. Though not so acute in India, it has been and still is a source of much misunderstanding and friction between the British and the Indians. The problem exists in one form or the other in many parts of the world to-day. Though a good deal of speculative and descriptive work has been done on the origin and nature of colour prejudice, up till now very few psychological studies have been attempted—especially studies which employ a quantitative technique. Yet it is a matter well within the purview of experimental social psychology. Such studies as at present exist are mainly confined to America, the outstanding exceptions being the work of Lapierre⁽⁷⁾ and Macrone⁽²⁾.

An important step in the isolation of the prejudice factor and its quantitative study was taken by Bogardus⁽¹⁾, when he perfected the technique of his Social Distance test. This was one of the earliest attempts at a scaling device for attitude measurement and has been since widely used both by its author and several other investigators. Bogardus himself has used his test extensively to study, among other things, the attitude of southern Whites towards the Negroes and that of those in the south-west to Mexicans. Macrone⁽²⁾ used it to test the attitude of the

European settlers in South Africa towards the African population. Among other recent attempts to measure Social Distance, the work of Dodd⁽³⁾ and Masuka⁽⁴⁾ deserve mention. The former had 1700 freshmen of the Beirut University as his subjects and the latter conducted his research in that Mecca of students of race psychology—Hawaii.

Thurstone's⁽⁵⁾ Method of Paired Comparisons is on an equal footing to that of Bogardus's Social Distance test from the point of view of technique for the measurement of attitudes. The method is an extension into the field of social psychology of the familiar principle underlying the Weber-Fechner Law. It is based on the assumption that one can judge the difference between two stated opinions with as much consistency and accuracy as between two specific weights. Thurstone and Chave have also used a rating technique based on the psycho-physical method of equal-appearing intervals. The Thurstone scale has been widely used in the United States and the results obtained have been similar to those obtained from the Social Distance test. Guilford⁽⁶⁾ has studied the racial preferences of 1000 students in the various American universities by using the Thurstone technique.

Lapierre⁽⁷⁾ has made an interesting comparative study of race prejudice in England and France. He used no questionnaire, test or scale of any kind but employed the simple device of introducing, as unobtrusively as possible during the course of conversation, the question "Would you let a good Negro live at your house?" Horwitz⁽⁸⁾ has studied the development of attitude towards the Negro, using as his subjects pupils from the schools of New York and the South from the kindergarten to the eighth grade. Campbell & Stover⁽⁹⁾, Droba⁽¹⁰⁾, Chen⁽¹¹⁾ and F. T. Smith⁽¹²⁾ have all made interesting studies in the experimental modification of the racial attitude, the subjects in all the cases being American.

II. AIM OF THE PRESENT RESEARCH

England with its wide colonial connexions in the East and its cosmopolitan metropolis affords unequalled opportunities for research to the student of racial attitudes. Yet very few have taken advantage of this fact. One of the main objects of the present research was to get some idea of the racial attitudes of the English, especially the residents of London. Bogardus's Social Distance test was employed for this purpose. As far as the present investigator knows, this test has never been used in England before.

Several investigators (Howells and Moore, among others, to whose work Murphy⁽¹³⁾ makes reference) have hinted at the possibility of a relationship between personality and social attitudes. For example, extreme liberalism and introversion or colour prejudice and conservatism, broadly speaking, may go together. Another object of the present investigation was to find out how far colour prejudice accompanied a particular type of personality as exemplified by the concepts of Introversion and Extroversion, and how far it was related to the social attitudes roughly described as Liberalism and Conservatism. An attempt has been made to inter-correlate Liberalism and Conservatism as measured by the Vetter test⁽¹⁴⁾, colour prejudice as measured by Bogardus's Social Distance test and Introversion and Extroversion as measured by Freyd's inventory⁽¹⁵⁾.

Lastly, the investigation aimed at making a comparative study of colour prejudice in England and France. Popular opinion recognizes a marked contrast between the attitudes of these two nations. Lapierre's study seems to confirm such a view. As a basis of comparison, fifty British and thirty French students were given the Social Distance test.

III. THE QUESTIONNAIRES

Three questionnaires were used in the present research:

(1) *Vetter's Attitude scale*. Vetter's scale consists of a set of thirty-six topics covering the following groups of opinions: (i) political, (ii) social, (iii) individual freedom, (iv) economic, (v) authority of religion and national tradition, (vi) international, (vii) inter-racial.

Under each topic a list of five graded opinions were given, ranging from radical to reactionary, and the subjects were required to choose the opinion that came nearest to their view. The test thus offered a convenient method of grading the subjects into radical, liberal, neutral, conservative and reactionary. As the scale was primarily intended for America, it had to be modified to suit conditions in Great Britain. In its modified form it consists of thirty topics, of which one is given below as an example:

In each of the sets of five opinions given below draw a circle around the number of the opinion with which you are most in sympathy (whether or not it expresses your *exact* view).

¹ These were backed up by a personal interview and another questionnaire for acquiring qualitative data. Full details of these are given in my thesis⁽¹⁶⁾.

(1) *Government Ownership.*

1. Governments should be prevented, as far as possible, from acquiring ownership or control of any lands, properties, industries or companies.

2. Only such enterprises as cannot be made to yield a profit under private ownership and are necessary to the nation should be under government ownership or control, such as young forests, parks, canals or posts and telegraphs.

3. Governments should be allowed to compete freely with private industries in the field of public utilities, such as water supplies, gas, electricity and transportation systems.

4. Governments should own and control all raw materials, and public utilities and such industries as in the nature of things tend to become monopolies.

5. Governments should own, operate and control practically the entire economic resources of the land.

Radical, liberal, neutral, conservative and reactionary opinions were awarded 5, 4, 3, 2, and 1 marks respectively. As some subjects did not mark certain topics, averages and not total marks were taken into consideration. Thus the highest possible average was 5 and the lowest 1. Averages were calculated to two decimal places.

(2) *Bogardus's Social Distance test.* The test consists of a series of seven questions about the subject's attitude towards a particular nation (there being a list of several nationalities). In each question five degrees of choice were offered—*any, most, some, few* and *none*. Macrone's version of the test as used for South Africa was employed, though the nationalities selected necessarily differed from his. The following ten nationalities or races were chosen: Canadians, Turks, Germans, Chinese, Americans, Red Indians, French, Indians, Italians and Negroes (five oriental and five occidental). A section from the readapted form of the test is given below as an example:

Underline the word which expresses, or most nearly expresses, the way you feel towards the members of other groups, nationalities, or races (as a class, and not the best members you have known, nor the worst) with regard to certain relationships stated below.

1. According to my first feeling reaction, I would willingly admit:

(a) Any: Most: Some: Few: No—Canadians as visitors to my country.

(b) Any: Most: Some: Few: No—Canadians to live and work in my country.

(c) Any: Most: Some: Few: No—Canadians to full citizenship, including the right to vote in my country.

(d) Any: Most: Some: Few: No—Canadians to my school or university, to profession or occupation.

(e) Any: Most: Some: Few: No—Canadians to my club.

(f) Any: Most: Some: Few: No—Canadians to my home as my personal friends.

(g) Any: Most: Some: Few: No—Canadians to close kinship by marriage.

The following scheme of marking used by Macrone was employed:

	Any	Most	Some	Few	No
As visitors	+ 2	+1	0	- 7	- 14
To live and work	+ 4	+2	0	- 6	- 12
To full citizenship	+ 6	+3	0	- 5	- 10
To school, university, etc.	+ 8	+4	0	- 4	- 8
To one's club	+10	+5	0	- 3	- 6
To one's home	+12	+6	0	- 2	- 4
To close kinship by marriage	+14	+7	0	- 1	- 2

Thus the number of marks varied according to the nature and degree of the statement endorsed. For example, willingness to have any members of a nationality as visitors received only +2 marks, as this does not involve a great amount of racial friendship, whereas unwillingness to admit any members received a large minus mark (-14), as this indicates the presence of definite racial hostility. The highest possible score was +56, indicating a high degree of racial tolerance, and the lowest possible score was -56, indicating marked race prejudice.

(3) *Freyd's Introversion-Extroversion test*. Freyd's list of introvert traits, converted into questions by S. Brahmacharya (17), was used. A few questions are given below as examples:

1. Do you limit your acquaintance to a select few?
2. Do you feel hurt readily?
3. Are you sensitive about remarks or actions which have reference to yourself?
4. Are you suspicious of the motives of others?
5. Do you worry over possible misfortunes?

Marks were based on a self-rating scale and the subjects were given the following instructions:

- Put 5 if you have the trait *very much* in you.
- Put 4 if you have the trait *much* in you.
- Put 3 if you have the trait *moderately* in you.
- Put 2 if you have the trait *a little* in you.
- Put 1 if you have the trait *little* in you.
- Put 0 if you *do not have* the trait at all.

As all the questions dealt with introvert traits, a high mark in this test was taken to indicate an introvert type of personality and a low mark the reverse. The highest possible marks were 355 and the lowest 0.

The results of these three tests thus provided a set of three scores, giving an indication of the subjects' radical-conservative, introvert-extrovert tendencies and their racial attitudes. Correlations were worked out on the basis of these scores. As four of the five oriental races given in the Social Distance test were so-called 'coloured races', the result of this test also served as a valuable index to the existence or otherwise of colour prejudice among the subjects.

The French version. In order to make a comparative study of the racial attitudes of British and French students, the Social Distance test was translated into French and given to French students, some resident in London and others in Paris.

IV. THE SUBJECTS

Three hundred mimeographed copies of these tests bound into booklets were distributed to British people, over 17 years of age, mainly resident in London. Of these, 175 copies were returned, completely filled up.

The subjects were almost equally divided as to sex, and ranged in age from 18 to 70. They included, besides fifty students, people of varied professions—accountants, bank officials, civil servants, clergymen, teachers, nurses, typists, etc.

Eighty copies of the French version were distributed, of which thirty were returned. The French subjects were all students above 17 years of age, and included almost equal numbers of each sex.

The reception to the questionnaires was uniformly good. Most of the people approached showed a great interest in the project and often asked for more copies to distribute among their friends. These offers of co-operation were fully utilized, as by this means the identity of the investigator was kept in the background. As he was an Indian, it was felt that if his identity were known, considerations of politeness might prevent the subjects from being as frank as they otherwise would. 109 of the copies thus indirectly distributed were returned.

V. RESULTS

The results of the inquiry are summarized in the following tables:

Table I. *Showing the average score for each nation in Bogardus's Social Distance test (British version)*

No.	Nationality	Score
1	Canadians	+ 24.5
2	Turks	- 3.7
3	Germans	+ 9.0
4	Chinese	- 1.6
5	Americans	+ 18.6
6	Red Indians	- 3.6
7	French	+ 16.4
8	Indians	+ 4.4
9	Italians	+ 3.3
10	Negroes	- 4.2

Table I gives the average marks for each nationality in this test. The Turks are the only ones amongst the six 'white' races to get a minus score, and the Indians the only ones amongst the four 'coloured' races to get a plus score. That the latter are ranked above the Italians forms an interesting commentary on the influence of political factors on racial outlook. Canadians seem to be the most popular and Negroes the least.

Table II. *Showing the correlation between the total scores for Vetter's Radicalism-Conservatism test, Bogardus's Social Distance test and Freyd's Introversion-Extroversion test*

No.	Traits correlated	<i>r</i>	P.E.
1	Social Distance and Radicalism-Conservatism	+0.516	0.037
2	Social Distance and Introversion-Extroversion	+0.096	0.05
3	Introversion-Extroversion and Radicalism-Conservatism	+0.078	0.05

Table II gives the inter-correlation of the three tests used in the present inquiry. It reveals the important fact of a positive correlation of +0.516 between the prejudice score as revealed by the Social Distance test and the Radicalism-Conservatism score as revealed by Vetter's test, with a probable error small enough to be negligible. The amount of correlation between Social Distance and Introversion-Extroversion as well as that between Introversion-Extroversion and Radicalism and Conservatism seems to be insignificant.

Table III. *Showing the average score for each nation in Bogardus's Social Distance test (French version)*

No.	Nationality	Score
1	Canadians	+22.3
2	Turks	- 4.6
3	Germans	+ 4.2
4	Chinese	- 4.9
5	Americans	+15.6
6	Red Indians	+ 3.8
7	English	+22.8
8	Indian	+ 4.3
9	Italians	- 0.4
10	Negroes	- 4.4

Table III gives the average score for each nationality in the French version of the Social Distance test. The order of popularity of the ten nations listed in the test is not quite the same here as that of the British version. The English replace the Canadians as the most popular nation in France and Chinese replace Negroes as the least popular. Two striking similarities between the British and French scores are: (1) Indians are the only coloured race to get a + mark in both, and (2) Turks are the only white race to get a - mark in both.

Table IV. *Showing a comparative statement of the average marks for the ten nationalities in Bogardus's Social Distance test for British subjects other than students, British students and French students*

No.	Nationality	British subjects other than students	British students	French students
1	Canadians	+ 21.2	+ 32.8	+ 22.3
2	Turks	- 8.6	+ 8.8	- 4.6
3	Germans	+ 4.8	+ 17.7	+ 4.2
4	Chinese	- 6.5	+ 10.7	- 4.9
5	Americans	+ 14.1	+ 29.9	+ 15.6
6	Red Indians	- 9.7	+ 11.6	+ 3.8
7	French	+ 9.9	+ 22.7	—
8	Indians	- 0.1	+ 15.7	+ 4.3
9	Italians	- 1.4	+ 14.1	- 0.4
10	Negroes	- 9.6	+ 9.5	- 4.4
7	English	—	—	+ 22.8

When the scores of the fifty British students were separated from the total scores of the British subjects, the average marks of the remaining seventy-five non-student British subjects showed striking changes. The prejudice scores for Turks, Chinese, Red Indians and Negroes went up and Indians now got a small minus mark instead of their previous plus mark. In Table IV, the column for British students at once catches the eye both for its high scores and for the entire absence of negative values. A comparison of the marks of the non-student British subjects and the French students reveals the fact that the prejudice score for Turks, Chinese, Red Indians, Indians and Negroes is decidedly smaller in the case of the French.

Table V. *Showing the difference in the average marks of the British and French students in Bogardus's Social Distance test and its reliability*

Average score for British students	+ 176
Average score for French students	+ 63
Difference	+ 113
P.E. for British students	21
P.E. for French students	29
P.E. (diff.)	35.6
Difference	3.2
P.E. (diff.)	

Table V shows that the average for the British students is very much higher than that for the French students, as revealed by the difference of +113 in favour of the former. The probable error of this difference is very low, 35.6 (slightly more than three times the difference); hence the difference has a high reliability value.

VI. CONCLUSIONS

The research produced a mass of interesting data and at least two conclusions of major importance. These conclusions are based upon (1) the positive correlation between Social Distance and Radicalism-

Conservatism, and (2) the scores of the French students in the Social Distance test.

Bogardus himself defines Social Distance as "the grades and degrees of understanding and intimacy which characterize pre-social and social relations generally". Negative scores in the Social Distance test would therefore indicate poor understanding and intimacy as regards the races concerned and thus reveal the presence of the prejudice factor. Since among the ten nationalities given in our version of this test, five belong to the 'coloured group',¹ we may look upon our score as a fair indication of the amount of our subjects' colour prejudice. An actual examination of the scores themselves reveals this clearly, since with the exception of Indians none in this coloured group get marks higher than any of the white group. Accordingly, the correlation of colour prejudice as revealed by the Social Distance test with Radicalism-Conservatism as revealed by Vetter's test, is in the opinion of the present investigator a finding of some importance. True that this correlation is nothing but a confirmation of the popular view that associates conservatism with 'clan-feeling' and liberalism with that larger outlook on life so necessary for racial tolerance. But even this confirmation of the popular view is not without its importance, having been achieved under such standardized conditions as those adopted in the present investigation and with such a representative sample of the public as we have had. Besides, independent of the popular view, the result has an intrinsic value of its own. For there is nothing inherently absurd in the combination of a conservative political or social philosophy and ideas of inter-racial friendship. Moreover, colour prejudice being by its very nature irrational need not be the concomitant of such reasoned-out systems of thought and outlook as those indicated by the terms liberalism and conservatism. Hence the finding of such a correlation was by no means a foregone conclusion (Tables I and II).

The poor correlation between colour prejudice and Introversion is not surprising, though its value as a negative finding is of some importance. The same applies to the poor correlation between Radicalism-Conservatism and Introversion.

An examination of the scores of the group of 175 British subjects who did the Social Distance test seems to establish with a fair amount of certainty the existence of a prejudice factor, since four out of the five nationalities in the coloured group get minus scores. The exception is Indians, who get a plus mark, and this may be taken as evidence of the

¹ Throughout this section, for the lack of a better descriptive label, the phrase 'coloured group' is used to indicate Turks, Chinese, Red Indians, Indians and Negroes.

fact that in the coloured group Indians are the most favoured, the positive score indicating even an anti-prejudice tendency. The ranking of Indians above Italians seems to suggest that as far as race prejudice is concerned, other factors besides colour often play an important part (Table I).

When the scores of the fifty British students were separated from the total, that of the remaining 125 British subjects showed many significant changes. There was an all-round increase in the prejudice scores and Indians, who previously had a plus mark, now get a small minus mark. There was thus now evidence of definite prejudice tendencies existing towards all coloured people, as far as the non-student British public was concerned, though this seems to be least operative towards Indians (Table IV).

Considering next the score of the fifty British students, we find that they contain no negative values and are uniformly high. Comparing their marks with those of the non-student part of our subjects, we are forced to conclude that there is a marked difference between the racial attitude of the British students and the British general public, and that in the case of the former colour seems to play little part (Table IV).

The results of the French group of thirty students who took the Social Distance test compared with the British group furnish us with one of the most striking conclusions of the present inquiry. Comparing their averages for the five coloured nations with those of the general British group of 175 subjects, we find very little evidence to support the popular view that colour prejudice is relatively far less in France than in England. Red Indians are the only nationality in the coloured group who get a positive score in the French version and a negative score in the British version. The prejudice score for the Turks and Chinese is higher among the French than among the British, and as regards Indians and Negroes the marks are almost identical in both groups. Our scepticism regarding the validity of the popular belief in this matter is further heightened by the enormous difference between the averages of the British students and the French students. Whereas none of the five coloured races get a negative score in the British student group, Negroes, Chinese and Turks do in the French group, and in some instances the difference in the scores is strikingly high in favour of the British group. We get however a confirmation of the popular view when we compare the French scores with the non-student British scores. The French prejudice scores are less than the non-student British ones in the case of Turks, Chinese and Negroes, while the Red Indians and Indians get

a positive score among the French and a negative score among the British. Taking all these facts into consideration the present investigator feels justified in concluding that whereas colour prejudice is less among the French students than among the general British public, it is undoubtedly much greater among them than among British students (Tables I, III and IV).

Not only public opinion but an investigator of such repute as Lapiere has credited the French with far less colour prejudice than the British. In his investigation of colour prejudice in England and France, he had as his subjects 315 British and 440 French. His figures give a striking confirmation of his contention regarding the relative lack of colour prejudice in France. Our figures seem to suggest a contrary conclusion, in some respects at least. However, it must be remembered that Lapiere was dealing with a much larger number of subjects both in France and in England, and in the case of the French, a far more representative group than ours. Besides, his method of introducing, casually during the course of a conversation, a question relevant to colour prejudice is quite different from the method of rating adopted in the present inquiry. Nevertheless, even when due regard is paid to all these facts, the difference between the results of the two investigations is far too striking to be passed over as entirely insignificant.

A comparison of the average scores for the five coloured races, for the British non-student group, the British student group and the French student group brings into view many interesting possibilities of further research. Does the British student become less idealistic and more prejudiced as he leaves the sheltered academic atmosphere of the university and enters the wider arena of life, as our figures seem to suggest? Does the French student become more broad-minded and less prejudiced as he ceases to be less of a student and more of a citizen, as a comparison of Lapiere's and our figures seem to suggest?

Our chief conclusions may be summarized thus:

1. That there seems to be a relation between the Liberal and Conservative attitude and the attitude of colour prejudice.
2. That no such relation exists between Introversion and colour prejudice, or Introversion and the Liberal and Conservative attitude.
3. That colour prejudice is less among the French students than among the British non-student public, but decidedly higher than the British students.
4. That there are differences within our subjects' attitude to the

coloured group—Indians being the nation against whom there is least prejudice.

In view of the small number of his subjects and the limitations of the methods of measurement used, the present investigator does not claim for these results any more importance than that of 'pointers'—pointing the way to further research, which is bound to throw a good deal of light on a problem of paramount importance not only to students of Psychology but to humanity at large.

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An Indian student conducting a social inquiry of the nature contemplated in the present research is necessarily at the mercy of his public. To my subjects and all friends in England and France who helped me in the distribution and collection of my questionnaire I wish to express my grateful thanks. The research owes much to the valuable guidance and helpful criticisms of Prof. J. C. Flugel, under whom I had the privilege of working in the University College, London.

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ON A PECULIARITY OF RECOGNITION IN THREE CASES OF KORSAKOW'S PSYCHOSIS

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I. INTRODUCTION

THE object of this paper is to describe a variety of paramnesia recently observed in three cases of Korsakow's psychosis. Our attention was first called to the phenomenon in the course of a routine test of recognition, but it soon became clear that the paramnesia might express itself equally under the conditions of ordinary life. It therefore seems possible that we have uncovered an interesting and hitherto unrecognized concomitant of the amnesic syndrome.

The phenomenon may best be described as a variety of *reduplicative paramnesia*. It is not, however, by any means identical with the experience described many years ago by Pick⁽³⁾ under this name. In the first place, it does not involve the projection of a series of actual experiences into the past. And in the second place, it lacks the quality of *déjà vu*. The essence of our phenomenon lies in a *failure to respond to identity*. Perceptual situations are treated as in some manner changed under conditions in which no objective changes of any kind have been introduced. Thus the patient is constantly unable to effect a judgement of identity in response to an unchanged situation. Many of his difficulties in adjustment to a constant environment can probably be traced to this deficiency.

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It is too early as yet to draw any conclusions as to the possible diagnostic value of our observations. It will be necessary to repeat the tests with other Korsakow cases and at different phases of the psychosis. Control experiments will also be required, and are already in progress. So far, these have failed to reveal the presence of this paramnesia in several cases of senile dementia. But the evidence is still far from conclusive.

We shall endeavour in this paper to give some illustrations of the paramnesia and of the conditions calling it forth in three cases of an alcoholic Korsakow psychosis. This will be followed by a tentative discussion of its nature and possible origin. We may, however, preface these observations by a brief account of the three cases studied.

II. CASES¹

Case A. Age 55 years. Male. Unmarried. Agricultural labourer.

The patient was admitted to a Cambridgeshire hospital in October 1939, and later transferred to the Cambridgeshire Mental Hospital, Fulbourn. He was under our observation from 10. xi. 39 to 13. iii. 40. The onset of the psychosis was sudden, and took the usual form of an acute alcoholic delirium. On his admission to Fulbourn, however, he presented a typical amnesic syndrome. There was an outspoken retrograde amnesia covering a period of at least fifteen years, which provoked a well-defined situational disorientation. There was further a remarkably complete anterograde amnesia. Indeed, the patient's memory for the period of the illness was virtually non-existent. Confabulation, however, was not strongly in evidence at any stage. In his thinking, the patient showed many illustrations of the apposition of irreconcilable propositions. He displayed the typical apathy of the Korsakow psychosis.

There was no essential change in this patient's mental condition throughout the period of observation. A measure of behavioural orientation was gradually re-established, but there was never true recognition of his surroundings or of those around him. The patient had a measure of insight into his memory deficiency, but was by no means cognizant of its full gravity. He was very prone to rationalization of an evasive character.

This patient had been an agricultural labourer for the greater part of his life. His educational status was low and his intelligence limited. He had seen service in France, and for a time his orientation was dominated by his war experiences. The anamnesis provided unequivocal evidence of chronic alcoholism.

The diagnosis was *alcoholic Korsakow psychosis, with peripheral neuritis*.

¹ I have to express my sincere appreciation to the following for granting me access to the case material and for invaluable co-operation and assistance in the work: Dr H. Travers Jones, Medical Superintendent, Cambridgeshire Mental Hospital; Drs L. H. Wootton, Superintendent, and J. C. Batt, Deputy Superintendent, St Ebba's Hospital, Epsom; and Lieut. J. P. Child, R.A.M.C., Banstead Military Hospital.

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Case B. Age 55 years. Female. Unmarried.

The patient was admitted to St John's Hospital, St John's Hill, on 6. vi. 39 and transferred to St Ebba's Hospital, Epsom, on 13. vi. 39, where she later came under our observation. On admission to St Ebba's, she was confused, bewildered and lost. Her memory was grossly impaired and she confabulated freely. The patient made frequent mistakes of identity and was disoriented both for time and place. She was in poor physical health, with peripheral neuritis in both legs.

A certain improvement in the patient's mental state could be observed after about six months in hospital. Her confabulations became much less spontaneous, and by the middle of January 1940, she was approximately oriented in all spheres. She also began to show some insight into her intellectual deficiencies.

The patient was under our observation from 27. ii. 40 to 7. vi. 40. She was throughout this period tolerably well oriented and confabulated only in response to highly suggestive remarks. She also displayed considerable insight into her amnesia. Immediate memory was good, but retention in general remained gravely impaired. There was further a diffuse retrograde amnesia extending over some fifteen or twenty years.

The case history was unfortunately very incomplete. It appeared that the patient had received a fair general education and had later worked for many years as a stenographer. She had artistic and literary tastes and a fair acquaintance with English literature. By temperament, she was very reserved and somewhat suspicious of the intentions of others.

The diagnosis was an *alcoholic Korsakow psychosis*.

Case C. Age 57 years. Female. Housewife.

This patient was admitted to St Alfege's Hospital, Greenwich, on 20. ii. 40, and transferred to St Ebba's Hospital, Epsom, on 5. iv. 40. She came under our observation between 25. iv. 40 and 7. vi. 40.

On admission to St Alfege's, the patient displayed a profound memory loss, and was disoriented and hallucinated, believing that there were monkeys in the ward. By 28. iii. 40, the amnesia was already less marked, and autopsychic orientation largely restored. On admission to St Ebba's, however, she was found to remain disoriented for time and place and fabricated freely. But she denied hallucinations. The tendency to confabulate abated rather rapidly, and by the time the patient came under our observation she no longer confabulated even under provocation. On the other hand, a fluctuating situational disorientation remained, together with a diffuse and generalized retrograde amnesia. Affect was decidedly labile and there was little insight. Immediate memory and the recall of quite recent events was surprisingly good.

This patient had received comparatively little education, but liked reading and could do simple accounts. She was happily married and had a family of grown-up children. The present illness apparently set in about four months previous to her admission to hospital, when she began to get worried about her younger son, who was of military age, and the possibility of air raids. Unequivocal evidence of alcoholism could not be obtained, but all the symptoms pointed towards an alcoholic aetiology.

The diagnosis was *Korsakow's psychosis with polyneuritis, almost certainly of alcoholic origin*.

It is advisable to give a brief indication of the extent of recognition defect present in each of the three cases during the period of observation:

Case A. This patient displayed by far the most pronounced anterograde amnesia, which affected recognition quite as markedly as recall. His 'memory span' appeared to be limited to 15-60 sec., and he consistently failed on simple tests of recognition in which the time intervals exceeded 1 min. He invariably failed to recognize the examiner on the successive interviews, some of which were separated by an interval of only one day.

Case B. Here the amnesia was less severe, and the patient was able to recognize the examiner on all interviews after the first. She gave good results on tests of immediate reproduction, and was sometimes able to recall very recent events with a very fair degree of accuracy. The temporal reference of these events was, however, extraordinarily poor. Her performance in tests of recognition will be indicated below.

Case C. This patient showed the least impairment of memory. Tests of immediate recognition and recall were executed satisfactorily, and recent events could be recalled fairly readily and with accurate localization in time. The examiner was invariably recognized without the least hesitation.

III. MATERIAL FOR FIRST TEST OF RECOGNITION

The paramnesia appeared consistently in all three patients and with all types of visual material. We may, however, select for our principal illustrations the responses of the patients to a set of six coloured post-cards, chosen for their possible appeal to the interests of the patients. The six cards are described below. Of these, P 1, P 2 and P 3 were given first, in succession, and each exposed for 20-40 sec. Half a minute after the removal of P 3, the three cards were shuffled up with three new cards, R 2, R 4 and R 5, and the whole series again exposed in a similar fashion. The order of presentation was uniformly R 1 (P 3), R 2, R 3 (P 1), R 4, R 5, R 6 (P 2). The recognition test was repeated in whole or in part on the same or a subsequent session.

P 1 (R 3). A scene in the bar of a public house. The barman and two customers. The former is young, clean-shaven, and is in his shirt-sleeves. He has on a blue striped shirt, a red tie, and a yellow pullover with a red border. The right-hand customer is middle-aged and extremely corpulent. He wears a black bowler hat, blue coat and trousers, red waistcoat, yellow tie, and brown boots. In his right hand he holds a paper and in his left a pipe. He is leaning against the bar, facing to the right, and there is a large glass of beer on the counter beside him. There is a brown bag on the floor by his right foot. The second customer is also lounging against the bar and faces the first. He wears a brown check suit and cap, a green waistcoat and a blue tie. He is smoking a cigarette. There is a small glass beside him on the bar. In the background are shelves laden with bottles.

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P 2 (R 6). A bench in the country. A young man, dark and rather handsome, sits on the bench with a young lady on his knee. He is in prominent blue R.A.F. uniform. The girl, also dark, is wearing a red dress. She strokes the man's face and he is holding her right arm. Her left arm rests on her lap.

P 3 (R 1). A Labour Corps unit at work. On the left, a low wall of sandbags, behind which are two soldiers in khaki. One of these has a spade over his shoulder. In the centre is a tall soldier in khaki uniform and a tin helmet. He carries a spade over his right shoulder and five sandbags on his head. On the right another soldier, probably an officer, who is expressing amazement at the spectacle and is literally 'falling over backwards' in his astonishment. In the background fields and trees.

R 2. A soldier in khaki chasing a girl, also in khaki, across a field.

R 4. Another scene in a public house. A barmaid and two customers. This card bears no obvious similarity to *P 1*.

R 5. Two female inebriates in a public house. A notice bearing the words 'Fine Old Gin' is prominently displayed above the bar. An irate barman is depicted on the right-hand side of the picture. There is no obvious similarity to *P 1* or to *R 4*.

The instructions varied slightly on the different exposures. In general, the patient was first asked to note each card carefully, so that he would know it if he should see it later on. On the re-presentation, he was asked whether he had seen the card before, or whether it was the first or the second occasion on which the card had been shown. Further questions were often given, whose nature will be clear from the illustrations given below.

Supplementary tests with other types of material were also carried out. These are described in the text.

IV. RESULTS OF FIRST TEST OF RECOGNITION

Case A. 2. ii. 40. The three cards were shown as described above. The patient examined each one carefully, and commented appropriately enough on the content. The immediate recognition test gave the following results:

R 1 (P 3). *Look here, have you seen anything like this before?* No sir. *Not this afternoon?* No sir. *Sure?* Yes sir.

R 2. No. *Sure?* Yes. *Have you seen anything like it?* No sir. Not a man running after a woman.

R 3 (P 1). *Have I shown that to you before?* No sir. *Sure?* Yes sir. *Have you seen anything like it?* Yes sir, but that's not the one I saw before. *What was the other one like?* There was a dog on the floor, wasn't there? *Apart from the dog, was it the same?* The dog layed against the man—to the best of my recollections. *Was the man the same?* He was dressed different to this man. This is a different dress. *What had the other man got on?* A natural suit, more like you've got on. *Have you seen a picture of a bar like this?* I saw a bar, but it wasn't like that. *Have you seen this card before?* I saw something like it, but it wasn't that card.

R 4. No sir. *Sure?* Yes sir, I haven't seen that before. *Seen anything like it before?* No sir, I don't remember seeing anything like it. *Have you seen a bar like it?* I've seen a bar, but not like that.

R 5. *Have I shown that to you this afternoon?* No sir. *Is this the first or second time you've seen this?* First time... 'Fine Old Gin'—I'd have known it if I'd seen that before....

R 6 (P 2). *Have you seen this before? Is this the first or the second time that you've seen this?* First time to my knowledge. *Seen anything like it before?* Yes, I see something like it, but this isn't the same card. *What was the other one like?* Man and young lady. That's all I noticed.

It will be seen that the three new cards are unhesitatingly rejected: there is no case of the acceptance of any of the new material as old. Of the three original cards, one is likewise rejected, but the remaining two elicit paramnesias of the type described above. In both cases, the card is rejected, but the patient confidently asserts that he has seen another card somewhat similar to it. The latter, however, is said to differ from the original card in certain important respects.

Certain of the cards were again shown immediately afterwards. We may quote the responses to P 1 and P 2:

R 3 (P 1). If I haven't seen this one, I've seen one like it. No. I don't think I've seen this one before—I should have noticed his red waistcoat. *Seen one like it?* All I noticed was a bar and some bottles....

R 3 (P 1) (two minutes later). *Have you seen this before?* No sir. *Seen anything like it?* Yes sir, something like it. I never noticed the man had a pipe in his hand. *Was it the same man?* It looks a bit like the same man. But I never noticed the red waistcoat, nor his pipe in his hand.... (Card is taken away, shuffled with the others, and again given.) *Is that familiar to you?* That's more like the one I saw. But I don't think I saw that one. I never noticed the glass of beer standing there.

R 6 (P 2). *Have you seen this one before?* No sir. I never noticed a gent. in a blue suit.

R 6 (P 2) (one minute later). *Now is this familiar to you?* I saw a gent. with a blue suit, but I haven't seen this one.

R 6 (P 2) (two minutes later). No sir. *Sure?* Well I feel sure. I've seen something like it but this is different—in the dress. Different in the man's dress, and also the young lady seemed dressed different. *But you've seen a man and a young lady?* Yes sir. (Card is taken away, shuffled with the others, and given again.) *Was that the young man and young lady that you saw first?* That I saw first, d'you mean? No, I don't think it is.

These examples bring out very clearly the patient's inability to respond to identity. In some cases, at least, it might appear that the deficiency is due to inadequate perception of the original figure. This might condition rejection of a card on the ground that some aspect or feature appears to the patient as genuinely novel. In order to check up

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on this possibility, the test was repeated in a slightly different form. This time, each card was presented for 2-2½ min. and a detailed description demanded. The recognition test was given after the removal of the last card.

7. ii. 40. *Descriptions:*

P 1. *Can you tell me anything about that?* It's an hotel, isn't it? *Go on—you describe it to me.* It's a bar. Couple of men having a chat together. Looks as if they were arguing a point about something or other. Fellow behind the bar looking at the others—he might have said something. *Can you describe the big man?* He's got a red waistcoat, blue jacket, blue trousers, hard hat on, pipe in his hand, paper in his other hand. *What's this down there?* A bag—portmanteau don't you call it? *Have you seen that before?* Don't think so, sir. If I did I didn't take any notice of it.

P 2. Well, they make one think of two courtiers. *What are they doing?* Well, the young lady's sitting on his knee. *Will you describe their clothes to me?* It seems as though he's talking to her, and she's looking at him pretty hard. He's got a blue suit on, the man. As for the lady, I don't know what you'd call her dress. *What colour is it?* Brown would you call it? Light brown? (*The patient is slightly red-weak.*) *D'you think she looks an attractive girl?* Yes sir.

P 3. Soldier's got some bags of earth on his head, it looks like. But he'll never carry five bags of dirt like that—not like that I should think, sir. If I had two on mine it would be enough. *Tell me about the rest of the picture. Are there other soldiers?* Well, there's two sitting beside them sandbags, and one behind the other there... and if he's got them full of soil he's very strong in the neck. *What's this fellow doing?* Well, he looks as though he's frightened, sir. Frightened lest they should fall. That's all I can tell you.

Recognition Test:

R 1 (P 3). *Have you seen this once or twice this afternoon?* It's the first time: I didn't notice the two sitting by them sandbags. *Have you seen one like that this afternoon?* You showed me one similar to it, but it wasn't like that one. *What about this man (central figure)? Was he the same?* He looked about the same man. I didn't take much notice of the man. I was looking at the shovel he was carrying. If he's got five bags of dirt he's very strong in the neck. *Was the other card like this one except for the two men?* Well, he hadn't got the sandbags on his head. If he had, I didn't notice them.

R 2. This the first time I've seen that one—to my knowledge.

R 3 (P 1). *Have you seen that one before this afternoon?* If I haven't seen that one I've seen one like it. *Would you say 'yes' or 'no'?* Yes, sir. *Are you sure?* Well, I'm not sure, but I think I have. *What makes you think you've seen it before?* Well, I saw the man behind the bar and the bottles.

R 4. No sir. *Sure?* Yes sir.

R 5. No sir. *Sure?* Well as far as I know I'm sure. *Have you seen anything like it?* I don't think I have. I didn't notice 'Fine Old Gin' before.

R 6 (P 2). *Have you seen that once or twice this afternoon?* This is the second time. *How do you know?* Well, I know I saw a fellow in a blue suit. Whether she was sitting on his knee or not I couldn't say. *But you think you've seen it before?* I think I've seen it before.

The complete recognition test was repeated after an interval of 20 min. On this occasion, the patient's responses were as follows:

R 1 (P 3). Yes sir. *How did you know?* I go by the sandbags on the man's head. The two sitting behind there and the one back there. I'll tell you what I think: If he's got five sandbags on his head full of dirt he'd be strong in the neck.

R 2. *Have you seen that once or twice this afternoon?* Once, I think. *Is this the first time you've seen it or have you seen it before?* This is the first time I've seen this card. *Have you seen any one like it?* I've seen something like it, but I don't think I've seen this one. *Why not this one?* I didn't notice the girl's legs, running away.

R 3 (P 1). I've seen that before sir. *How long ago?* About ten minutes or a quarter of an hour. *How do you know?* If I haven't seen that one I've seen one similar to it—with the bottles of beer and the glass standing on the table. *Have you seen that one before or one like it?* I don't think I've seen this one before. It was a different one. *What makes you think it was a different one?* I didn't notice that man there (left) when I noticed the beer.

R 4. No sir. *Have you seen one like it?* I've seen one similar to it but I haven't seen this one. I tell you I didn't notice 'Beer is Best'...

R 5. *Have I shown that to you this afternoon already?* It seems to look different. I saw something like it. I tell you I never noticed 'Fine Old Gin'; nor that old lady leaning up against the bar. I don't think I've seen that before.

R 6 (P 2). *Have you seen that once before this afternoon?* I don't think I've seen that before. No. I've seen one something like it. This is a different one to my idea. *In what way different?* The girl is sitting differently on the man's knee. They look younger too. *How was the other girl sitting?* She was sitting on one leg and not on two. *Have you seen it this afternoon or not?* Don't think I've seen it before.

There is some slight evidence from the above records that the frequency of paramnesia is slightly reduced by a more intensive scrutiny of the original material. On the first test, only one of the three cards elicits a well-marked paramnesia, but in this case, at least, it is plain that the reduplication cannot be due to any deficiency of apprehension. In the delayed recognition test, we find copious examples of paramnesia, for, with one exception, the patient treats the cards as new, though similar in varying degree to those previously shown. We may therefore conclude that the paramnesia has its origin in a deficiency of memory rather than in one of apprehension.

Case B. 29. iii. 40. Each card was shown for $1\frac{1}{2}$ –3 min. in order to control for possible deficiencies of apprehension. The patient was asked in each case for a full description of the picture. Her responses were as follows:

P 1. Bar of a public house. Landlord recounting something funny—no—having a lively argument or chat. No, he's recounting something. The man on the right looks a little simple, or a little doubtful of the tale. The man on the left—he's looking up and pondering the tale. *D'you see anything else?* The man's bag. Ah yes! Should I

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be right in thinking the man's glass on the right is empty and his on the left full? If so, I'm right in thinking he looks a little 'empty' in the face. Am I right in saying this right glass is empty? If so, they are perhaps waiting for each other to pay.

P 2. Oh doctor! Am I to describe it? It's a lady in a very summery dress—in fact it hardly is a dress; it is a dress I suppose. Flirting with a soldier—an airman. *Is there anything else you can see?* There's nothing else strikes me.

P 3. I can only describe the great ease with which he's carrying five bags of sand presumably. He looks as though things are blowing up at the back and he's unconcerned. That's all I can make of that. *How many men in the picture?* Four. *Anything else you can say about it?* He has five sacks on his head and a spade on his shoulder. *What about this fellow (left)?* Well he's going off the deep end in two senses, doctor!

Re-presentation of the whole series followed immediately on the conclusion of the last description. The responses in each case were as follows:

R 1 (P 3). *Have I shown that to you before?* Yes. *I have?* I should say yes. I might describe it as slightly different. *You'd say 'yes'?* I should say 'yes' on the surface.

R 2. No. *Sure?* Quite.

R 3 (P 1). That's not quite the same, doctor. That man's glass (left) was bigger and this one's (right) was not quite so narrow and not quite so high. The bag was different. *How?* Well it hadn't those creases, and I think the handle may have been different. Perhaps I'm wrong.

R 4. No, I haven't seen that.

R 5. No. *Sure?* Yes. You're talking about to-day? *Yes. You haven't seen it to-day?* No doctor, my impression is no.

R 6 (P 2) (perplexed). Well doctor, it's almost exact and yet it doesn't seem quite the same. *How does it seem different?* I'm not swearing it is different, doctor, but I'm thinking it is. I'm thinking the man's foot was a little more forward; it was showing beyond the near foot. *Any other differences?* I think the man and the girl had more colour in their faces.

We note that the new material is rejected unhesitatingly. The original three items all produce reduplicative paramnesias of varying degree of intensity. The paramnesia is least marked in the first card and most marked, perhaps, with the third. As with the previous patient, it is an apparent difference of detail which governs the response. The tendency to reduplication is brought out even more markedly in the following responses elicited on immediate re-presentation of the three test cards:

R 1 (P 3). Well if that's not the one the other one was very much like it. *Would you say yes or no to that?* I could think there was a slight difference, but it would have been very slight.

R 3 (P 1). I thought that man's glass was bigger. And had he got a pipe? I'm not sure of that. *Were the men the same?* To the best of my ability I should say they were.

R 6 (P 2). Yes. *Sure?* There seem to be two of these, doctor. One with the man with his right foot coming forward, and with more colour in his face. More colour in both their faces. And wasn't she looking up?

A delayed recognition test was carried out after an interval of four weeks. The following responses were produced:

25. iv. 40. R 3 (P 1). Yes. *You have?* I don't... Yes I have, doctor. *Sure?* I should say it was the same with a difference. In the other one the landlord had his left arm raised up. I don't know but that I've seen several others. You've got the same picture with several details different. The glasses, for instance. *When did you see this picture?* I should say the last time I came... I had an interview. *With me?* I don't think so, doctor. *But a doctor showed it you, did he?* To the best of my recollection. Or did I find it lying in something and look at it after it had been shown me?... I'm inclined to think it was not you who showed it to me. *How long ago was it?* That I saw that or a similar one? I suppose it was my last interview with the doctor. *A day ago?* A little more than that. *A week?* It seems recently.

R 6 (P 2). Yes I've seen that. *Sure?* I've seen perhaps two other versions of that, doctor. *Similar to that?* Yes. *Have you seen this one?* No. I saw one in which his right foot was showing in the front and one in which the girl's left arm was round his neck, and possibly one in which she was extending her arm and showing some crimson knickers, would it be? *Did I show it to you?* I can't tell you. *Does it seem very familiar?* You've got a series I imagine with the same idea.

R 1 (P 3). No, I've not seen that. It's the same idea worked up differently. *Seen something like that, have you?* Yes. *Any idea where you saw a card like it?* Can't be sure of that. The sacks weren't white ones and there weren't so many. It had variations as the other had.

The remaining three cards in the series were all rejected as unfamiliar. In one case there was a suggestion of the reduplicative phenomenon.

We note from these records of delayed recognition that the reduplication is now well-established. In the first case, the 'original' picture is said to differ from the present one in several points of detail, despite the fact that it is at first accepted. There is even a suggestion that *several* similar pictures may be involved. In the second case, the multiplication is even more definite. The present card is identified, but it is suggested that at least two other similar cards have also been shown. In the third case, the picture is definitely rejected, and the patient's verdict that it represents "the same idea worked up differently" epitomizes the character of the paramnesia. It is interesting to note the poor spatial and temporal localization of the original presentations.

The recognition test was repeated after a further lapse of several weeks and yielded substantially the same results.

Case C. This patient, as we have already said, showed a far less serious disturbance of memory than the other two patients. Indications

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of paramnesia, however, quite in line with the responses of the previous cases, were nevertheless obtained.

On 27. iv. 40, the material was presented in the usual manner and adequate descriptions of each of the three cards obtained. An immediate recognition test gave the following data:

R 1 (P 3). Yes. *Sure?* Yes.

R 2. No. *Sure?* Yes.

R 3 (P 1). Yes. *Sure it was that one?* Yes.

R 4. No, I didn't see that this morning. *Sure?* Yes.

R 5. No, I haven't seen that.

R 6 (P 2). Yes. *Sure it was that one?* Oh no! I don't believe it was. The other was in a different frock. *What sort of frock had the other one got on?* Blue. I didn't take much notice, but I think it was.

In only one case do we note the emergence of a paramnesia based on an alleged difference of detail. There was, however, more definite evidence of the phenomenon in a re-test on the following day:

R 1 (P 3). *Did you see that one yesterday?* Yes. *Sure?* Quite sure. That's the sandbags.

R 2. Yes I see'd that one. *Sure?* Yes.

R 3 (P 1). Yes. With the bag. *Sure?* Well I think there was two, wasn't there? One I know was that one. *What was the other one like?* In the other one the bag wasn't so big and the man was further inside than that. *So you've seen two like this?* It looks to me as though there's two different ones. *But this is one of them?* Yes, that's one of them.

R 4. Yes. I've seen that one yesterday. *Sure?* Yes. *Have you seen anything else like this?* No, I don't think so.

R 5. I don't know whether I've seen that one or not, don't think I did see that one yet. *Did you see one like it yesterday?* Yes I might have done. I don't think I saw that one, yet I've got a recollection I did.

R 6 (P 2). Yes I've seen that. There were two of those. One had got a blue dress and one a pink one. *Was this one of the two?* Yes. She was sitting on his knee. I don't think she was in the other one.

We see that there is a clear-cut reduplication in the case of P 1 and P 2. In both cases the picture is recognized, but it is argued that a similar picture has also been presented.

On a re-test, several weeks later, there was further multiplication. Again the cards were recognized, but in the case of P 1 and P 2, the patient asserted that she had seen *two* other similar cards in addition to that now shown. She was very confident as to the correctness of her surmise, and indicated several of the 'points of difference' between the cards.

V. RESULTS WITH OTHER TYPES OF MATERIAL

We may now pass on to a short description of analogous results obtained with different types of material. These may be grouped under five headings: (1) picture material; (2) verbal material; (3) common objects; (4) spatial environment; and (5) productions of the patient. Systematic tests were not undertaken, but contributory evidence was forthcoming in all fields. The majority of the tests were conducted with Case B.

(1) *Picture material*. The observations described above could be repeated at any time and with any type of picture material. We may give a few supplementary illustrations to prove that the paramnesias cannot be ascribed to any peculiarity of the original test cards:

Case B. 21. iii. 40. This was another test of immediate recognition. Five postcards, mainly of scenery, were shown each for 20 sec. and represented immediately after with five new cards. All five cards elicited paramnesias of the type described. Three of these may be quoted:

1. *A church*. That's similar, but the roof didn't go up like that and the building again was deeper coloured. The tower was not so narrow and not so tall. The whole thing was deeper coloured. That's my impression.

2. *A mosque*. I saw something similar, but I think I should recognize the real one. I don't think that was the one. *In what way is this different from the other one?* To begin with, it's paler; the parapet is narrower and not so deep. There were two figures in the background, I think, and these two figures were more to the right—they were all nearer this way, surely. And the one on the left was deeper coloured, surely. And this writing I don't remember seeing: I'm not saying it wasn't there.

3. *A cottage*. I saw something similar in colouring, but certainly not that. *How was the other one different from that?* Ah! It was deeper in colour. I should say there were two figures on the left in addition to the man. *Was the cottage the same?* The cottage I think was a longer and shallower one and the gates were not so high. The wall would not be so high, and I think the colouring of the sky would be richer.

Similar results, though rather less circumstantial, were obtained with Case A on this test.

It seems reasonable to conclude that the emergence of a reduplicative type of paramnesia in response to visual material is not bound up with any specific peculiarity of the test material.

It may perhaps be suggested that these paramnesias derive in part from a measure of assimilation between the different items in a test series. That this factor cannot however be the sole, or even the essential, cause of the phenomenon is clear from the following observation:

Case B. 21. iii. 40. A drawing of a man, a dog and a duck was shown to the patient on 14. iii. 40. She gave a full description of the drawing at the time, and was tested for recognition one week later:

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Have you seen that before? Something similar at any rate. *How was the other one different?* Well if you tell me I saw a different one, doctor, I'll enlarge upon it. I don't want to give way to imagination. I might have imagined that the man was older and taller; the brim of his hat not so big. And the dog was more a type of bloodhound, and bigger, and the duck perhaps smaller. I think the other duck—was a duck. This is a goose, isn't it? The dog hadn't a large tail; it had a tight-skinned tail—a tight-skinned dog. Should I be right in thinking the man had leggings and gaiters on? And smaller feet? An older man? I think he had a stick in his left hand and no lead.

In this case, the patient is far from confident as to the existence of two cards, but the similarity of the paramnesia to those already described is unmistakable.

(2) *Verbal material.* Detailed tests of verbal recognition were not undertaken. In several instances, however, a passage of prose read once to Case B and re-read after a few minutes elicited judgements identical in principle with those already described in reaction to the visual material. Fewer points of difference were adduced, but the patient almost always said that the passage was "not quite the same" as that originally read. These tests could not be carried out with Case A, as he was incapable of pronouncing a judgement of identity upon any passage consisting of more than about twenty words. A longer passage would invariably be treated as completely novel.

(3) *Common objects.* Some simple experiments on the immediate recognition of common objects were also made. For instance, the patient was handed a silver propelling pencil and told to examine it carefully. A few minutes later, the pencil was again given to the patient, who was asked to say whether it was the same or a different pencil. The front page of a newspaper was also used in the same way.

(a) *The pencil tests.* Case B. 23. v. 40. The patient was handed the pencil and instructed to scrutinize it carefully for 20 sec. It was then removed out of sight, and given back to her after 1 min.

Is that the pencil you saw just now? Well doctor, without being able to give a specific reason I should say it's not. It seems different round the top. But I can't swear that it is different.

The pencil was again removed and given back to her after a further lapse of 1 min.

Have you seen this before? (Examines it.) I should think that is the original one, doctor. You've certainly got two pencils there, doctor. Whether you've got three I can't swear. I shall have to leave that open whether you've got three. I don't remember so much dark (enamel) round the top. It seemed a tiny bit smaller.

The test was repeated in the same way with the same pencil on the following day:

Is that the pencil you saw just now? Roughly I should say that's the same one. I noticed the writing.

The pencil was removed and given back with the same instructions after 2 min.:

Is that the same pencil as I showed you just now? I should say not, doctor. This thing changes its appearance as you move it. The other had a longer, narrower appearance. I didn't notice it changed to that extent, doctor. I think perhaps it's the same pencil and you alter the top of it about. I said that "it may be" and not that "it is".

The pencil was again removed and given back after 6 min.:

Now what about this pencil? I may have seen it before, doctor, but it wasn't the one you've been showing me. It's smaller round the top. I should think you can manipulate the top somehow. All the same I'd venture to say that it's not the one I saw last.

The pencil was presented again 1 hr. later, and the patient asked to tell what she can about it.

It seems as though you've got three pencils, doctor. This thing (at the top) is wider and shorter than the others. I *don't* think I'm looking at one and the same pencil. This one does *not* go narrow as the other one did.

Case C. 24. v. 40. The pencil is shown for 20 sec. and the patient allowed to examine it carefully. It is given again after 1 min.

Is that the same pencil I showed you before or a different one? Yes (that's the one). *Sure?* I don't think it was. I couldn't tell you. *Why don't you think it's the same one?* Well I thought it had a pen at the end. No... I think it is the same one.

The test is repeated on 30. v. 40. The patient recalls the previous test, but is not sure whether the pencil is the same as before. The pencil is re-presented after 1 min.:

Does this seem to you to be the same pencil or a different one? It does and yet it doesn't... I didn't think it was quite so long as this. *Would you say it was the same pencil or a different one?* It might be the same.

The pencil was removed and given back after a further interval of 3 min.

Is this the same or a different pencil? Same. *Sure?* No, I don't think it is. The top of this one is bigger and the point is out. *How many pencils have you seen?* Two.

(b) *The newspaper test. Case B. 23. v. 40.* The patient was given the front page of the *Daily Telegraph* and told to look at it carefully for 2 min., paying special attention to the headlines. The paper was then removed, but restored to the patient 3 min. later.

Was this the paper I showed you just now? No. But I've seen it before, doctor. Surely. Wait a minute. My impression is that I've seen it before, but it's not the one you showed me. Wait a minute. (Reads) "Deadly Hush in Brussels"—that seems familiar... I've seen that before but I don't think that's the one you showed me. (The paper is removed for an instant and replaced.) *Was this the one I showed you?* This is the one you showed me first. Haven't you shown me one since?... Yes, this is the one—unless these papers are got up specially for the hospital tests.

This test was repeated from time to time and gave very similar results.

One may safely conclude from the above records that the paramnesia is by no means confined to reaction under the conditions of our card-recognition tests. Objects in common everyday use elicit very much the same types of response and bring out equally clearly this curious inability to treat a given object as identical on two successive exposures.

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(4) *Spatial environment.* The relation of the reduplicative tendency in recognition to the wider problem of topographical orientation demands further study. Some attempt was made with one of the patients to assess how far the paramnesia described might influence reaction to the larger aspects of her environment. Thus we frequently asked Case B whether she recognized the room in which all the interviews took place. In some cases, she appeared to do so without difficulty; in other cases, however, there was evidence of some reduplication.

Case B. 7. vi. 40. Where did you see me before? Over here. In this room? I thought I turned to the right and not to the left. I think I turned to the room immediately on the right when I went in (to the ward). Have you been in this room before? If not, doctor, I've been in one absolutely similar. Was it this one or a different one? I should say it was the same but the direction is confused. Have you seen this desk before? My impression is it was a desk with drawers on both sides. (The present desk, which has stood in the room throughout, has drawers on one side only.) So last time you saw me I was sitting at a different desk? That's my impression, Doctor. And this pencil, have you seen it before? (the pencil used in the above tests). That's not as I saw it. There was a marking on the side. And this chart? (a visual acuity chart which has been hanging on the wall throughout). I can't say that this is familiar to me. There was something of that kind that I saw.

Case A, on the other hand, invariably failed to recognize both the examiner and the room in which all the interviews took place. On no occasion did he give any evidence of a reduplication comparable with his responses to the test cards.

(5) *Productions of the patient.* Some further experiments were made on the recognition of simple designs actually drawn by the patient. On 3. v. 40, Case B drew a copy followed by six successive reproductions of an incomplete rectangular figure. Fifteen seconds after completing the last reproduction, the latter was handed to her and she was asked whether or no it was her own handiwork.

Did you draw that? Yes, because I did the fiddling about at the end.

She was then handed the fifth reproduction, with a similar query:

I can't swear to that. I believe I did. I did that thing down there because I tried to straighten the line out. Otherwise I might question it.

To the fourth reproduction, her reply was:

I'm sorry, doctor, I can't remember doing that.

On 31. v. 40, the patient drew a copy and six successive reproductions of the Binet-Simon 'Key' pattern. Certain of her drawings were submitted for recognition 5 min. later.

The copy. Did you draw that? Yes I remember drawing that double line to make it shorter. But I can't say I remember that 'squiffy' line. I must assume that I drew it.

I didn't know my drawing is quite so bad. *Does it give you a sense of familiarity?* As being my own handiwork? Well I must assume it is because of that double line. I don't remember this bit here (the bottom). I don't think I did it. I do *not* recognize it as my own handiwork. I must assume I did it.

The second reproduction. Did you draw that? No. *Sure you didn't?* Yes. *Totally unfamiliar is it?* Yes. I don't think I did it. I feel as sure as I can be that I didn't do it.

The sixth reproduction. D'you think you did that? Yes.

In none of these instances is the paramnesia of the reduplicative variety, yet we note in several cases a differential forgetting affecting a part of the design which provokes a reaction not altogether unlike the consciousness of difference so prominent in the earlier recognition tests.

Spontaneous drawings were usually recognized correctly by this patient, even after an interval of several days. Occasionally, however, there was evidence of a similar kind of distortion in memory. Thus presented with a horse which she had drawn 5 min. earlier, the patient remarked, in a somewhat perplexed manner, that "it might have been a little slimmer, but it is the same horse"!

We may sum up our observations in the following paragraphs:

(1) Visual material re-presented after an interval was found to evoke in very many cases a peculiar variety of paramnesia. This may best be described as a failure, not of recognition, but of the capacity to respond to identity.

(2) The paramnesia may take one of two forms:

(a) The object in question is treated as altogether novel and as differing in important respects from the original object.

(b) The object is identified correctly, but is regarded as one of a number of similar objects all of which have been shown previously.

(3) There is some evidence that the tendency to reduplication increases with increase of time interval between the successive exposures. This, however, applies only between certain limits which vary from case to case.

(4) It is probable that the paramnesia may be evoked by all varieties of psychological material.

VI. DISCUSSION

A full-dress attempt at explanation of the phenomena which we have described is beyond the scope of the present paper. In the first place, our data are insufficient. In the second place, it must be borne in mind that the peculiarity of recognition here described is but one comparatively minor feature of the highly complex amnesic syndrome. But it is,

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nevertheless, possible to give some account of the principal factors at work in provoking the phenomena. These will certainly have to be considered in any more ambitious attempt at a psychological interpretation of Korsakow's psychosis.

First, there is the part played by *obliviscence*. No one would deny that the rate of forgetting in the Korsakow patient is tremendously accelerated. But the *differential* character of the forgetting has not been adequately acknowledged. Thus, again and again in the test situations, an object presented for recognition was rejected because *one aspect* struck the patient as genuinely novel. It seems that in such a situation the patient finds himself confronted with an object in part old and in part new. He is solicited for a judgement of identity or difference with respect to this object *as a whole*. The only available mode of response in such cases is to treat the latter as a *modified form* of the original object. Hence the reduplication: this object is new, but it is a modification of the original.

Obliviscence, in the sense of simple forgetting, cannot, however, be held responsible for all the cases of reduplicative paramnesia which we have recorded. There is an important class of cases in which an object presented to the patient for the second time is treated as novel on the ground that *certain of its characteristics appear significantly different from the corresponding characteristics of the original*. It is not merely that new features appear to have been added, but old features are said to be changed. This type of paramnesia was prominent in the responses of Case B, who often adduced a whole series of inconsistencies between the two exposures of a single card. In this variety of recognition failure, it is necessary to suppose that there has been some active change in the organization of past experience. Indeed it seems probable that the deficiency of recognition has its source in an aberration of recall.¹ Possibly we may speak of *constrained confabulation* in this connexion. At any rate, the subjective transformation of memory contents is undoubtedly a factor of importance in the genesis of paramnesia.

It is necessary also to consider in this connexion the recognition process in its affective aspects. Claparède (1), and after him MacCurdy (2), has urged that the Korsakow patient is typically deficient in the sense of *personal familiarity* with his environment. The patient is said to be

¹ The fact that constructive changes introduced in recall may influence the character and accuracy of recognition in normal subjects has been demonstrated elsewhere by the present writer (4, 5). It is reasonable to assume that these effects will be even more pronounced in the Korsakow syndrome.

virtually incapable of integrating contemporary experiences with the personality. It is claimed that this deficiency of synthesis precludes the appearance of a feeling of familiarity, of reference to the self, in responding to a repeated situation. We cannot enter here into the implications of this position, but it is reasonable to inquire whether a poverty of synthesis of this kind can be held responsible for the paramnesias described in these pages.

One of our patients, Case A, gave clear evidence in certain situations of the curiously 'de-personalized' mode of recognition which has been demonstrated by Claparède and MacCurdy. No definite evidence of such behaviour could however be obtained from the other two patients. But in all three cases there was good reason to believe that contemporary events failed to find an enduring place in the personality structure of the patient. Case A, in particular, displayed a quite remarkable restriction of his personality in accordance with the scope of the retrograde amnesia. Any new response which he could be induced to acquire might express itself in correct recognition. But this recognition lacked all sense of familiarity and reference to the personality. Indeed this patient appeared to experience familiarity solely in reference to certain persons in his immediate milieu, and in these cases the familiarity was invariably justified by misidentification of a confabulatory character. In the other two cases, both of whom at the time of the investigation were better oriented and less amnesic than the first, it appeared that contemporary events could be linked in some measure with the personality continuum. But even so, this linkage was comparatively feeble. Case B, as we have seen, was able to recognize without undue difficulty her own spontaneous drawings, but paramnesias were constantly evoked by the more artificial and less personal material used for the main tests. This observation in itself suggests that a defective sense of personal reference may play some part in provoking the phenomenon. At any rate, it is reasonable to suppose that an object poorly invested with personal reference would facilitate the emergence of paramnesias of a reduplicative type.

It is probable that further factors will have to be considered before a complete explanation of our results can be given. For example, the role of insight in inducing an attitude of extreme caution was prominent in one of our patients and may be of general significance.

The factor of suggestibility, constantly brought forward in discussion of the amnesic syndrome, may also play some part in conditioning the responses. Then there is the question of intellectual integrity. The apparent absence of reduplicative paramnesia in senile patients may

indicate that a measure of intellectual critique is a necessary condition. The analysis of these various factors will provide a fascinating series of problems for future investigation. Lastly, there is the need for a fuller analysis of the paramnesia in relation to the major symptoms of the amnesic complex. This will be attempted in a forthcoming paper.

VII. SUMMARY

1. Illustrations are given of an hitherto unrecorded variety of paramnesia in three cases of an alcoholic Korsakow psychosis. It is pointed out that this paramnesia is essentially the expression of an incapacity to respond to identity.

2. Some possible causes of the phenomenon are discussed. Differential forgetting, transformation in recall, and deficient personal reference are adduced as the three most important factors.

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SOME FACTORS OF INTELLIGENCE

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*From the Psychological Laboratory of the University
of Cape Town*

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I. INTRODUCTION

As a result of the analyses and discussions of recent years there is a widespread belief in the existence of a general factor, 'g', running through all intellectual activity. Interpretations of this factor differ, Spearman accounting for it by quantity of energy, Kelley by heterogeneity, Thomson by the nature of the sampling process; but there is a general agreement that, however it arises, it is a convenient and satisfactory functional unity. The chief dissentient is Thurstone, and in his recent elaborate analysis of fifty-seven tests⁽³⁾ he finds nine defined factors, none of which is common to all the tests. Thurstone's argument, however, is inconclusive, and Holzinger & Harman have shown, by analysing the same material, that the data do not preclude the existence of a general factor⁽²⁾.

One of the strongest arguments in favour of the conception of 'g' is the fact that in many of the standard group intelligence scales the inter-correlations of the tests can be explained in terms of a single common factor. And it seems natural to suppose that when the scale is extended by the addition of other tests which break the hierarchy, the single factor previously identified continues to exist, and should be sought for in the more complex material.

At the same time it must be recognized that the persistent functional unity of 'g' is a hypothesis which requires confirmation and which may

be subject to modification and even to rejection in the light of further evidence. For instance, when we are dealing with a complex correlation matrix into which 'g' is presumed to enter, along with other factors, it is not sufficient to extract a general factor which we identify with 'g' without giving adequate consideration to the effect which this has on the interpretation of the other common factors. All the factors should be considered together, and if the postulation of 'g' renders difficult a psychologically plausible interpretation of the factors as a whole, then it is necessary to revise the postulate and to modify the conception of 'g'.

II. EXPERIMENTAL PROCEDURE

(1) *Test material*

We have been fortunate in obtaining from Dr M. L. Fick, of the South African National Bureau of Educational and Social Research, permission to use extensive data collected by him⁽¹⁾, which make it possible to approach the problem from this point of view. Fick has extended an existing scale of the Binet type by adding fresh items at the upper levels, and in order to select these items he gave a number of different tests to 1497 school children. Our analysis sets out from the intercorrelations of ten of those tests, most of which are of a well-known character. They are as follows:

1. Formboards. These are the Worcester formboards, II^A, IIIA, IIB and IIIB.
2. Repetition of digits.
3. Repetition of digits backwards.

These two tests consist of the series contained in the Stanford Revision, with additions.

4. Match test. As this test, which was originally devised by Dr E. G. Malherbe, is probably unknown to English readers, a description of it may be given.

The materials required are a set of nine stiff cards, numbered 1-9, each measuring 3 by 12 in., and divided by lines into four equal squares. On these cards match sticks are glued in various patterns, as shown in Fig. 1. The subject is given about twenty additional match sticks with which to operate.

The procedure is as follows: The first card is shown to the subject for 6 sec.; it is then taken away and he is asked to reproduce the pattern with the loose matches supplied. The same procedure is adopted for each of the next five cards, but for the seventh card it is changed. The subject is now told that there ought to be four figures on the card, arranged in the same way as those on card 6. Three of them, however, have been lost, and the subject has to reproduce them with loose matches in the vacant squares on the card itself. Cards 8 and 9 are dealt with in the same way as card 7.

5. Absurdities. This includes items from Terman and Burt.
6. Porteus mazes.

7. Arithmetic reasoning. This is Terman material with additions.
8. Reasoning test, based largely on Burt.
9. Vocabulary test—50 words, given in the Terman fashion.
10. Dissected sentences—an extension of the Terman test of this nature.

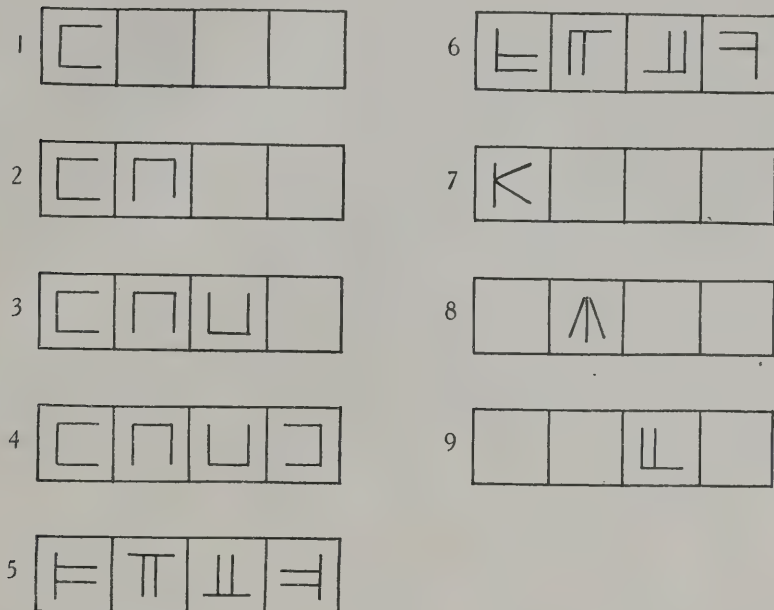


Fig. 1.

(2) Method and subjects of experiment

The tests were given individually by Fick himself to 1497 Transvaal school children, 723 of them being English-speaking and 774 Afrikaans-speaking. They were chosen from Standards V–X inclusive, and their age range was from 12 to 18. They were not, however, distributed uniformly over this range, the average age being almost exactly 15 years, and the probable error of the distribution 12 months. Two points call for comment here.

In the first place the children were selected on a definite basis. Fick's main purpose was to obtain age norms, and for this reason he selected and tested only those pupils in each standard whose age did not deviate by more than 6 months from the median age for the standard, calculated for the whole country.

Secondly, there was a language complication. Some of the tests are verbal in nature, particularly 9 and 10, and care had to be taken to

equate these tests in the two languages. For this purpose Fick relied on two considerations. On the one hand he believed that his principle of selection ensured that the two halves of his population were approximately equal to one another in ability and schooling; and on the other hand, when two groups, of English- and Afrikaans-speaking children respectively, obtained equal average scores on performance tests, numbers 1, 4 and 6, he assumed that they were of equal ability and therefore expected them to show equal average scores also on the language tests. Accordingly, the form of the language tests was adjusted until such results were secured. The difference between the tests in the two languages is probably not greater than the difference between two forms of a single test in the same language.

On the whole the results do not seem to us to be vitiated by the use of the two languages, but the method of selecting the subjects introduces an uncertainty. Undoubtedly the correlation with age is enhanced, as the extreme cases at each age are rejected. This does not involve the introduction of any fresh common factors into the analysis, but it must make some difference to the saturation coefficients themselves. The general effect is to limit the variance of each test as compared with an unselected sample of the same size drawn from the total population. But as we are unable to give any measure of the extent of this limitation, all we can do is to treat the given variance as unity, and to recognize that somewhat different saturation coefficients of the final factors might be obtained from an unselected sample. There seems to be no reason to believe, however, that the analysis itself would be fundamentally altered.

III. TREATMENT OF TEST RESULTS

(1) *Factorial analysis*

The intercorrelations of the ten tests, as calculated by Fick, are presented in Table I. This matrix was submitted to factorial analysis by Thurstone's centroid method. Fick himself made a first approximation to the communalities by taking the highest figure in each column. From the factor loadings obtained in this way we made a second approximation, and from the new factor loadings a third approximation was reached. The final centroid matrix, which is presented in Table II, is thus the outcome of three successive applications of the centroid method.

Five factors appear to be necessary. The probable error of the average correlation coefficient is 0.0166, and the average residual does not come down to this value until five factors have been extracted. If only four

factors are extracted, the residuals are too large to be accounted for in terms of random error. Five is therefore the minimum number of common factors by reference to which the correlation table may be explained.

Table I. *Correlation matrix*

Decimal points are omitted

	1	2	3	4	5	6	7	8	9	10
1	—	027	103	231	241	178	254	217	138	109
2	027	—	477	137	164	115	194	169	183	144
3	103	477	—	263	166	266	256	249	338	261
4	231	137	263	—	184	200	249	293	249	217
5	241	164	166	184	—	047	243	303	203	179
6	178	115	266	200	047	—	267	258	263	273
7	254	194	256	249	243	267	—	319	307	130
8	217	169	249	293	303	258	319	—	348	205
9	138	183	338	249	203	263	307	348	—	537
10	109	144	251	217	179	273	130	205	537	—

Note. There is a discrepancy in the table between the two versions of the value r_{310} . We have taken the mean of the two values, viz. 0.256.

Table II. *Centroid matrix*

	I	II	III	IV	V	h^2
1	0.353	0.327	0.058	0.099	0.087	0.252
2	0.441	-0.283	-0.544	0.031	0.028	0.572
3	0.584	-0.269	-0.260	0.154	0.031	0.505
4	0.461	0.131	0.072	0.104	0.110	0.258
5	0.432	0.331	-0.148	-0.315	0.115	0.431
6	0.446	-0.069	0.193	0.266	-0.075	0.317
7	0.516	0.179	-0.019	0.125	-0.173	0.344
8	0.548	0.189	0.035	-0.020	-0.127	0.354
9	0.636	-0.195	0.240	-0.231	-0.143	0.574
10	0.534	-0.341	0.372	-0.229	0.221	0.641

The factors obtained directly by the centroid analysis have of course no immediate psychological significance, and the axes must be rotated. This process cannot be undertaken in a purely mechanical fashion, but must be guided by psychological considerations. Some of the points we have allowed for here are as follows:

(1) All the coefficients in the correlation table are positive, and although there are several possible explanations of this, the simplest one is the existence of a general factor, such as 'g', with which all the tests are positively loaded. Throughout the process of rotation we tried if possible to preserve such a factor.

(2) The correlation between tests 9 and 10 is unduly high in comparison with the rest of the table, and this suggests the presence of a verbal group factor.

(3) The correlation between tests 2 and 3 is also high, implying the presence of another group factor. *A priori* its precise nature is not clear,

for it may consist either of facility in dealing with numbers or of some wider memorizing or retentive ability.

(4) One further consideration is relevant here. It is highly probable that all the common factors underlying the tests are positive, and hence, when the axes have been rotated to their final position, there should be no significant negative loadings.

There is, however, one value in the correlation table which makes it difficult to reconcile the first and last of these assumptions. The correlation between test 5 (absurdities) and test 6 (mazes) is only 0.047. Both of these tests would commonly be regarded as having a reasonably high saturation with 'g', and yet if this were so, the resulting correlation ought to be much larger than that experimentally found. The correlation r_{56} is the lowest in both columns in which it appears, and the correlations of these tests with test 2 (repetition of digits), into which presumably 'g' does not enter in any high measure, are on the average three times as large as their correlation with one another. Of course it may be that the error of r_{56} is unusually big. But if the correlation is augmented by three times its probable error it still falls short of 0.1, and thus leaves little room for a general factor of any magnitude. Moreover, when the correlation between tests 5 and 6 is reconstructed from the factors obtained by the centroid analysis—and these of course are determined by all the data in the table and not only by the correlation between tests 5 and 6 themselves—the figure obtained is 0.046, a result which is hardly compatible with the idea that its original value was seriously in error.

It seems therefore that the first and fourth of the assumptions which we were prepared to adopt may prove inconsistent. If 'g' is significantly present in all the tests, there must be other factors with negative loadings to account for the low value of r_{56} . If, on the other hand, negative loadings are excluded, there is no general factor in all the tests. This dilemma is a real one, and we had to choose between the first and the fourth of the assumptions. We were prepared to accept 'g' as commonly understood if we could give a psychological meaning to the negative loadings of the other factors which its retention entailed. But we failed in this endeavour. None of the bi-polar factors which we considered gave any promise of a psychological meaning, and hence in the end we abandoned the first assumption in favour of the fourth.

The method of rotation adopted was primarily graphical. The factors were plotted against one another in pairs, and when an angle of rotation was chosen, the new factor loadings were calculated by the suitable orthogonal transformation. In the end seven rotations were retained, and

the transformation matrices which they involve are shown in Table III. The ideas governing these rotations are (a) the avoidance of significant negative loadings, (b) the isolation of two factors, one of which is defined mainly by tests 9 and 10 and the other mainly by tests 2 and 3, and (c) the possibility of giving a psychological meaning to the remaining three factors.

Table III. *Transformation matrices*

I	II	I	III	III	IV	I	III
$\begin{bmatrix} 0.84227 & 0.53905 \\ -0.53905 & 0.84227 \end{bmatrix}$		$\begin{bmatrix} 0.50387 & 0.86378 \\ -0.86378 & 0.50387 \end{bmatrix}$		$\begin{bmatrix} 0.93881 & 0.34444 \\ 0.34444 & -0.93881 \end{bmatrix}$		$\begin{bmatrix} 0.97168 & -0.23630 \\ 0.23630 & 0.97168 \end{bmatrix}$	
T_1		T_2		T_3		T_4	
	III	V	II	III	IV	V	
	$\begin{bmatrix} 0.82728 & 0.56180 \\ -0.56180 & 0.82728 \end{bmatrix}$		$\begin{bmatrix} 0.98058 & -0.19612 \\ 0.19612 & 0.98058 \end{bmatrix}$		$\begin{bmatrix} 0.96153 & -0.27472 \\ 0.27472 & 0.96153 \end{bmatrix}$		
	T_5		T_6		T_7		

The final factorial matrix is given in Table IV, and in Table V the percentage of the variances to be attributed to each factor.

Table IV. *Factorial matrix*

	I	II	III	IV	V
1	0.048	0.441	0.168	-0.002	0.165
2	0.755	0.002	-0.016	0.038	0.013
3	0.635	0.040	0.248	0.054	0.189
4	0.173	0.316	0.250	0.080	0.245
5	0.209	0.528	-0.028	0.326	-0.040
6	0.162	0.091	0.477	-0.031	0.233
7	0.254	0.360	0.386	-0.019	0.005
8	0.218	0.390	0.368	0.138	0.002
9	0.244	0.077	0.528	0.478	0.039
10	0.143	-0.071	0.361	0.592	0.368

Table V. *Percentage variance*

		I	II	III	IV	V
1	Formboards	—	19	3	—	3
2	Digits forwards	57	—	—	—	—
3	Digits backwards	40	—	6	—	4
4	Match test	3	10	6	1	6
5	Absurdities	4	28	—	11	—
6	Mazes	3	1	23	—	5
7	Arithmetic	6	13	15	—	—
8	Reasoning	5	15	14	2	—
9	Vocabulary	6	1	28	23	—
10	Dissected sentences	2	1	13	35	14

(2) *Interpretation of the factors*

(a) The nearest approach to a general factor is the first one, but it cannot be 'g'. It looks like a memory factor. It is present in a high degree in the two tests where one would expect such a factor, viz.

2 (digits forwards) and 3 (digits backwards); it is absent in test 1 (formboards); and it is present in a low but almost uniform degree in the other tests. These results appear to be compatible with the interpretation of it as immediate memory span, although of course it may be some more complex memory function.

(b) The fourth factor is obviously verbal. Its main loads are in tests 10 (dissected sentences) and 9 (vocabulary). It also enters into test 5 (absurdities), and has a small but presumably significant load in test 8 (reasoning). This factor may also be complex, and the data are hardly sufficient to allow it to be defined more closely.

There is nothing surprising in the appearance of these two factors in the battery, as their presence was suggested beforehand by the correlation table, and we deliberately looked for them. The remainder of the analysis however appears to be new.

(c) In the fifth factor the highest load is in test 10 (dissected sentences), and then follow tests 4 (matches), 6 (mazes), 3 (digits backwards) and 1 (formboards), in that order of magnitude. The other loads are negligible. In all the tests in which the factor is significant the tasks involve the arrangement or rearrangement of sensory material, and the interpretation which we suggest is that it consists in some kind of manipulative fluency or elasticity in dealing with perceived sensory data. It is a form of dexterity, but mental and not manual, and, so far as the present tests go, confined to perceived objects.

(d) We are now left with the second and third factors. Both are present, in almost equal proportion, in tests 4 (matches), 7 (arithmetic) and 8 (reasoning). Although both are also present in test 1 (formboards) the second factor has much the greater weight. This second factor is present, and the third absent, in test 5 (absurdities). On the other hand the third factor is present and the second absent in tests 9 (vocabulary), 6 (mazes), 10 (dissected sentences) and 3 (digits backwards). Incidentally it may be remarked here that the analysis accounts for the smallness of the correlation between test 5 (absurdities) and test 6 (mazes). Each of them correlates reasonably well with the other tests, but, apart from the memory factor, they do so by virtue of separate factors, and consequently do not correlate with one another.

Neither the second nor the third factor can plausibly be identified with 'g' in its ordinary interpretation. If the third factor is interpreted as 'g' the absence of it in test 5 (absurdities) is difficult to explain, and the low saturation of test 1 (formboards) is also a stumbling-block. On the other hand the attempt to identify 'g' with the second factor is

precluded by the absence of that factor from tests 6 (mazes), 9 (vocabulary) and 10 (dissected sentences).

In point of fact 'g' seems to be divided here into two separate and independent factors, and the problem is how to describe them. The critical tests are 5 (absurdities), 6 (mazes), 9 (vocabulary) and 10 (dissected sentences). What does test 5 (absurdities) possess that 6 (mazes), 9 (vocabulary) and 10 (dissected sentences) lack, and what does it lack that is present in them? If test 6 (mazes) can be taken as a guide, the third factor conditions the ability to see a path through a maze and to follow it. If we separate this ability from the contributions due to memory and to perceptual dexterity, it may be regarded as the ability to make, or isolate, and follow a plan. It is not a visual factor, and is not confined to sensory material, for it is equally marked in the ability to define words and to perceive the meanings of disarranged sentences. It would thus appear to be a synthetic and constructive ability as well as an analytic one. It is the power to find or make a significant pattern in a mass of irrelevant material.

(e) In comparison with this factor the second one appears negative, and the main guide to it is the part it plays in the perception of absurdities. This perception is not immediate, but involves inference and implication and the apprehension of a general idea. For the subject is required to show why the given statements are absurd or how the premises involve contradiction. If he has such an ability he will be in a position, in many tasks, to rule out certain lines of thought or action. He will see that certain paths lead nowhere, and will not require to go to the end of each of them to discover that he is in a cul-de-sac. The ability therefore may be described as one of logical elimination.

If this conception is right, the presence of the second factor in test 1 (formboards) is clearly intelligible. The perception that a particular block cannot fulfil the conditions required for the completion of a pattern, no matter how it is turned, will save endless trial and error and be of the utmost value for the performance of the task. Unless the subject sees that certain general conditions have to be satisfied in a formboard problem he is at the mercy of chance, nor indeed will he have much success unless he can go further and deduce from the conditions which he has grasped the exclusion of all the wrong shapes.

The second factor, as we have seen, is lacking in tests 6 (mazes), 9 (vocabulary), 10 (dissected sentences) and 3 (digits backwards). In none of these cases is it feasible to exclude unnecessary steps and minimize trial and error by means of implications drawn from a principle or general

idea. In the maze a blind alley cannot be actively eliminated unless the eye travels to the end of it. Wrong definitions of words are not excluded by inference from a general idea. In the test of disarranged sentences there are few if any principles to be appealed to, and once the right idea is obtained, the answer is given immediately. And finally, in repeating digits backwards it is fatal to proceed by elimination. The moment alternatives present themselves explicitly to the subject's mind he is confused and lost.

From a comparison of the two factors the following difference emerges. When the third factor is dominant irrelevancies are brushed aside or neglected because the thinker is holding to something which he sees clearly, or, to change the metaphor, he does not take bypaths because he is following a defined road. On the other hand, when the second factor is dominant, irrelevancies are set aside because they are perceived to be irrelevancies. Extensive trial and error is avoided, because attention is given to false procedures and their implications are seen. From this point of view the presence of both factors in the match test, in reasoning and in arithmetic seems completely intelligible. For the second factor by itself does not go far enough. In test 5 (absurdities) it may be adequate, since the test itself requires no more than the perception of the absurdity; but when more than this is needed it fails. Although it excludes mistakes and closes bypaths, by itself it supplies no positive contribution towards finding the true road or providing a solution. It does not lead one through the maze, nor give the proper explanation of a word, nor rearrange a sentence. For these we have to rely on the third factor; and in ordinary reasoning processes, whether dealing with arithmetical or other material, as well as in the match test, both factors are important.

IV. CONCLUSIONS AND FURTHER TREATMENT OF RESULTS

The results which we have reached are difficult to reconcile with the accepted conception of 'g' as a unitary character, and since there is a reasonable quantity of evidence in favour of this conception, some comment is called for. Undoubtedly batteries of tests have been applied where the correlation table can be accounted for by a single factor; and the problem is to explain how this can happen if intelligence tests are really as complex as our analysis would suggest.

In the first place, it may be noted that not every grouping of intelligence tests satisfies the tetrad equation criterion. It is well known, for example, that tests of the Binet type involve more than one common factor. Secondly, a verbal factor has been recognized for some time, and

undoubtedly this factor does enter into batteries of tests which satisfy the tetrad criterion. That is to say, these tests, although they appear, when analysed by themselves, to imply only one common factor, are really complex and involve at least two common factors. Moreover, it is difficult to believe that a memory factor, such as we have isolated, does not also enter into them. Thirdly, tests which satisfy the tetrad criterion and are grouped in a battery to measure 'g' have in many cases been selected under the guidance of this criterion. They are the survivors of larger batteries from which tests which disturb the hierarchy have been ejected. And when this procedure is adopted it is possible to obtain a residuum of tests which, analysed by themselves, are consistent with the assumption of a single common factor but which in reality are complex.

We may illustrate this situation from the battery which we have been considering. Ignoring for a moment the analysis which has just been made, let us adopt the procedure which would be natural on the assumption that there is a single general factor, and that the hierarchy is disturbed only by group factors. Wherever a group factor is suspected to link two or more tests, we shall retain only one of these, and by this method derive a sub-battery which will measure 'g' as adequately as possible. Obviously tests 9 and 10 cannot both be retained as they have a verbal factor in common; let us omit 10 and retain 9, which has notoriously a high correlation with 'g'. Again, tests 2 and 3 cannot both remain, but neither has a strong claim, for they would normally be regarded as poor tests of 'g'. Hence both should probably be omitted. Finally, tests 5 and 6 cannot be incorporated in the battery together because of their low intercorrelation. Let us retain test 6, which has greater scope and has been more widely used. This leaves us with tests 1, 4, 6, 7, 8 and 9. Three of these, it may be noted, are performance tests, and accordingly there is still some risk of a group factor remaining.

Taking these six tests, let us examine their correlation matrix. Assuming a single common factor and applying Spearman's well-known formula,¹ we obtain the following factor loadings:

Tests	1	4	6	7	8	9
Factor loads	0.386	0.483	0.456	0.572	0.592	0.521

Reconstituting the correlations by means of these factor loadings and subtracting them from the original correlations, we obtain a set of residuals, the mean numerical value of which is 0.022. The probable error of the mean correlation coefficient in this reduced table is 0.016,

¹ *Abilities of Man*, Appendix, equation (21).

and the residuals therefore appear to be slightly too large to be accounted for by random error. Presumably there is still a group factor involved in the correlation table. As already suggested, this may be associated with the performance tests, and *a priori* an overlap is likely between tests 1 and 4, both of which involve manipulation. Let us drop test 1.

Applying the same method of analysis to the remaining five tests, we obtain the following factor loadings:

Tests	4	6	7	8	9
Factor loads	0.456	0.455	0.550	0.601	0.566

The average residual is now 0.010, which is less than the probable error of the average correlation coefficient. This reduced battery would obviously satisfy the tetrad equation criterion, and 'g' might well be postulated as the explanation of the intercorrelations of these five tests.

This result may be compared with the factorial analysis of the same tests based on their examination along with the rest of the original battery. The relevant figures, extracted from Table IV, are reproduced here for convenience, together with the values of *h*, which enable a direct comparison to be made with the saturation coefficients of 'g' presented in the preceding paragraph.

Table VI

Test	I	II	III	IV	V	<i>h</i>
4	0.173	0.316	0.250	0.080	0.245	0.508
6	0.162	0.091	0.477	-0.031	0.233	0.563
7	0.254	0.360	0.386	-0.019	0.005	0.586
8	0.218	0.390	0.368	0.138	0.002	0.595
9	0.245	0.077	0.528	0.478	0.039	0.757

If the analysis given in Table IV is sound, it will be observed that there are two factors common to the five tests, together with three group factors. And it may be added that the communalities are significantly higher than those obtained when the five tests are examined in isolation. The unity of 'g' therefore, in this instance at least, would appear to be spurious in the sense that it does not maintain itself when the tests are made part of the larger battery.

A difficulty remains. The correlation matrix of the five tests which we have just discussed involves two general factors and three group factors; nevertheless these five factors can apparently be replaced by a single factor, and the matrix treated as if it were of rank one. In general a reduction of this kind cannot be made unless (a) the group factors are insignificant, and (b) the general factors are proportional to one another. Neither of these two conditions is fulfilled in the present case, and it seems a refuge of despair to say that the result is merely accidental.

The situation would be an impossible one if the data were infallible, and a matrix which is genuinely of rank five cannot be reduced to rank one. But the position is changed when the data are fallible, for the two factorial matrices are not equivalent to one another, and hence the problem of reducing one to the other does not arise. Both give approximations to the original correlation matrix, neither of them differing from the data by larger values than can be accounted for by random error. But they do not differ from the original in the same way, and the residuals obtained in the two cases are different. If the correlation matrix constituted from the five factors of Table VI is analysed anew and a single centroid factor extracted from it, the residuals average 0.014, a value which is not incompatible with the assumption that one common factor is sufficient to explain the table. Thus the difference between the two analyses is covered by random error.

A further consideration may be mentioned here. If an artificial correlation matrix is constructed from a number of factors equal or nearly equal in number to the variables, and an attempt is made to analyse it by the centroid method, it will frequently be found, particularly if the number of variables is small, that the first factor extracted in this way accounts for most of the co-variance and that relatively little is left for the others. Accordingly, if allowance has to be made for probable errors, all factors other than the first may easily be swamped. This appears to be what has happened in the case we have been discussing, and we suggest that it is not of infrequent occurrence.

Of course the group of five tests which we have isolated here cannot be regarded as a normal representative of those batteries which are commonly employed to measure 'g', and the composition of the latter may differ considerably from that of the former. Nevertheless we may claim that our analysis creates a presumption that 'g' is complex, and obviously the next step is to analyse a more orthodox battery of tests, commonly recognized as measures of 'g', together with other tests similar to those which we have discussed in this paper.

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'TYPE'-FACTORS IN AESTHETIC JUDGEMENTS

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- I. *The problem* (pp. 262-263).
- II. *Ranking of pictures* (pp. 263-264).
- III. *Results and conclusions* (pp. 264-266).
- IV. *Relation to temperamental factors* (pp. 267-269).
- V. *Summary* (p. 269).
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I. THE PROBLEM

WHEN we analyse a table of correlations between the rankings of pictures or other aesthetic material by a number of subjects, we almost always find that the first factor to be extracted is a general factor with saturations which are positive throughout. The nature of this general factor has been discussed in a previous article⁽¹⁾; the '*T*'-factor, as it was called there, was shown to extend over eighteen different tests of visual aesthetic appreciation, and to correlate with general factors extracted from tests of colour appreciation, appreciation of polygonal forms, and of preferences for odours.

When the influence of this factor is eliminated, a secondary, bipolar factor can be found, which has positive and negative saturations in roughly equal numbers. Factors of this kind may be of great interest and importance, dividing as they do the population into different groups or 'types'; but they also present special difficulties to the investigator. As Davies has shown in her survey of researches involving correlations between persons, the influence of the bipolar factor is generally considerably smaller than that of the general factor; on the average, she found the general factor to be approximately five times as strong as the bipolar factor⁽²⁾ (p. 412).

She also found that in the majority of cases the residuals on which the bipolar factors were based were not statistically significant. 'In forty-four out of the forty-eight researches... examined the first factor will account for all the variance and covariance within the limits imposed by the probable error' (p. 418). In particular, in none of the twelve re-

searches involving aesthetic material was a statistically significant second factor to be found.

We are, then, faced with the problem of increasing the relative influence of the bipolar factor, and of reducing or eliminating the influence of the general, positive factor. This problem, as I shall endeavour to show, can best be solved by the suitable selection of experimental material.

II. RANKING OF PICTURES

Great differences in 'goodness' among the pictures in a test produce a particularly strong general factor in that test. Consequently, as far as practicable, the pictures in each of the five sets used in this research were selected with a view to making them equal in 'goodness'; for that purpose only pictures of acknowledged merit were chosen. It might be objected that such a conventional standard is not necessarily the correct one to take; the relative success of our effort to reduce the importance of the '*T*'-factor, and to increase the importance of the various bipolar factors, is perhaps sufficient answer to this objection.

The five sets of pictures used are described below. They were:

Set A. Fifty-one landscape paintings, reproduced on postcards. The selection of artists is fairly representative, covering the period from Dürer's time to our own.

Set B. A further fifty-one landscape paintings, reproduced on postcards. The selection was similar to that described above.

Set C. Thirty-two portrait paintings, reproduced on postcards. The artists whose work is included here range from the early Italians to Modigliani and Kissling.

Set D. Thirty-two photographs of statues. The artists whose work is included were Kolbé, Maillol, Barlach, and Klimpsch.

Set E. Fifty-one landscape photographs, uncoloured, by a well-known Austrian artist, Dr Defner. All these pictures were hand-produced. Dr Defner himself was kind enough to select 108 photographs, from his stock of several thousand, which to him appeared of roughly equal merit; a further selection was then made by three judges who had scored particularly highly in the '*T*'-test.

Thus altogether two hundred and seventeen pictures were used in this part of the investigation. Fifteen subjects were asked to rank the pictures in each set in order of liking, using a scheme of grouping which closely approximated to the normal distribution curve. The subjects were artists, university students, bank clerks, typists, and teachers, eight women and seven men. Their ages ranged from about twenty to seventy.

These rankings were correlated, and from each of the five tables of correlations two factors were extracted. The first factor extracted was significant in every case; the second factor was significant in every test

except the 'statues' test. The significance of the second factor was tested by examining the significance of the residuals on which it was based; the criterion used was Fisher's test of the difference between the theoretical and the actual correlations, expressed in terms of their inverse hyperbolic tangents ($z = \tan h^{-1} r$).

III. RESULTS AND CONCLUSIONS

The percentages contributed to the variance by the first and second factors in each of the five tests are given in Table I.

Table I

Test	Percentage of variance	
	Factor 1	Factor 2
	%	%
A Landscapes A	35	12
B Landscapes B	31	12
C Portraits	27	17
D Statues	29	8
E Photographs	14	11
Average	27	12

In three of the tests, the ' T '-factor is the first to appear; in the two Landscape tests its influence has been sufficiently weakened to let the bipolar factor appear first. In these two tests, the ' T '-factor appears as a bipolar factor, which is of course due to the method of analysis which inevitably makes the second factor to be extracted have both positive and negative saturations.

Our reason for assuming that the factor appearing in all these tests is ' T ' lies in the fact that the factors extracted from the two Landscape tests and the Photographs test correlate significantly with those extracted from the Portraits and Statues tests; but as these two tests had also been included among the eighteen ' T '-tests, we know that both are highly saturated with ' T ' (cf. (1), Table I). The intercorrelations of the five tests for this factor are given in Table II, together with their standard errors.

Table II

	B	C	D	E
A	0.341 ± 0.24	0.147 ± 0.26	0.492 ± 0.21	0.131 ± 0.26
B	—	0.459 ± 0.21	0.666 ± 0.15	-0.050 ± 0.27
C	—	—	0.446 ± 0.22	0.126 ± 0.26
D	—	—	—	-0.030 ± 0.27

When this table is analysed, the saturations shown in Table III are found for the five tests.

Table III

	Test	Saturation
A	Landscapes A	0.519
B	Landscapes B	0.714
C	Portraits	0.551
D	Statues	0.829
E	Photographs	0.070
	Variance	0.355

We are not, however, primarily concerned with the '*T*'-factor; the table given above lends support to the conclusions reached in our previous paper, by showing that the influence of '*T*' extends also to landscape paintings and photographs. But our chief interest lies in the other factors, an examination of which may throw further light on the nature of aesthetic judgements.

The first question that suggests itself in this connexion is: What is the meaning of these bipolar factors? We can answer this question by examining the pictures which characterize the positive and negative aspects of the factors respectively.

As regards the two landscape tests, the answer is clear enough. We are dealing here with an opposition between such artists as van Gogh, Corinth, Kokoschka, Cézanne, and Gauguin on the one hand, and Constable, Ruisdael, Rubens, Wilson, and Hobbema on the other. The one group of subjects prefers the modern, impressionistic, colourful pictures; the other group prefers the older, more conventional, less colourful pictures. Such a dichotomy has of course often been suggested on theoretical grounds; Dr Dewar also found some evidence of it in her research (3), p. 36), but none of the residuals on which this suspected factor was based was as high even as three times its probable error.

As regards the portraits, we find a similar opposition between artists such as Modigliani, Augustus John, and Laurencin on the one hand, and Reynolds, van Eyk, and Botticelli on the other. Again one group prefers the modern, colourful pictures, the other group the older, more conventional ones.

The distinction in the photographs test is not so clear, but one group seems to prefer the sunlit, bright, happy landscapes, with trees and clear skies, while the other group prefers dark, foreboding landscapes, with overcast skies and wild, drifting clouds.

The main opposition in the statues test seems to be between the art of Kolbe and Klimpsch, and that of Barlach and Maillol. This opposition has been expressed with great insight by Carls, in his book on Barlach: "Not adoration of form but adoration of truth determined Barlach's

creative life... Thus it follows that Barlach is a destroyer of form (Formaufwöhler), not a confirmer of form (Formfestiger). Kolbe creates the beautiful, Barlach the characterful" (4), p. 18).

From the descriptions given above of the bipolar factors entering into these five tests, it will be fairly clear that those extracted from the two landscape tests and from the portraits test are very similar. Does this similarity also extend to the two other tests? This question can best be answered in the form of a table giving the intercorrelations of the bipolar factors (Table IV).

Table IV

	B	C	D	E
A	0.957 $\pm$ 0.02	0.701 $\pm$ 0.14	0.548 $\pm$ 0.19	0.327 $\pm$ 0.24
B	—	0.813 $\pm$ 0.09	0.496 $\pm$ 0.20	0.437 $\pm$ 0.22
C	—	—	0.406 $\pm$ 0.22	0.642 $\pm$ 0.16
D	—	—	—	0.340 $\pm$ 0.24

When this table is analysed, the saturations shown in Table V are found for the five tests:

Table V

	Test	Saturation
A	Landscapes A	0.867
B	Landscapes B	0.939
C	Portraits	0.876
D	Statues	0.559
E	Photographs	0.542
	Variance	0.601

It would appear, then, that we are dealing with one factor running through all the five tests. This factor has been called the 'K'-factor; it differentiates, as we have seen, those who like modern art, bright, sunny photographs, and Kolbe statues, from those who like the older masters, cloudy, foreboding photographs, and the statues of Maillol and Barlach. The following suggestion may be offered as an explanation of this factor.

Gestalt psychologists, in particular Hornbostel, have drawn attention to what they have termed 'intersensory perception' (cf. (5), pp. 145 *et seq.* for a summary of this work). In particular, stress is laid on a 'brightness factor', which is apparent in music, vision, and other sense modalities.

It appears possible that we are dealing here with this same factor of brightness. The 'lovely bright colours' of the modernist contrast with the duller colours of the older masters; in a similar way the bright, sunlit photographs preferred by one group contrast with the dark, cloudy pictures liked by the other group. The statues created by Kolbe are bright and happy in the main—'schicksallos schön', as Carls says—while those created by Barlach are 'schicksalhaft betont'.

IV. RELATION TO TEMPERAMENTAL FACTORS

Whether this hypothesis be accepted or not, the reality of the 'K'-factor can hardly be doubted. In order to explore the psychological ramifications of this factor further, it was decided to correlate it with tests of temperamental and other qualities of psychological interest. But before proceeding to find the relation of the 'K'-factor to these qualities, it became necessary to construct a short, yet accurate, test of this factor. The five tests described above, suitably weighted, would of course constitute the best test available; but these tests take too much time, both in the giving of the test, and in the calculation of the results, to be used on a larger number of subjects.

Hence what will be called the 'K'-test was constructed. As the opposition between the two types of pictures which characterize this factor is most clearly manifested in the two landscape tests and the portraits test, only pictures from these tests were used in the 'K'-test. Altogether, one hundred pairs of pictures were chosen, in such a way that one of them exemplified the 'bright' or modern type of picture, the other the older type. These pairs were selected, wherever possible, so that the subject portrayed was more or less the same—a bridge, a mill, mother and child, and so on.

The pictures used were taken from the three tests described above, and also from several preliminary tests which showed essentially the same opposition between the two types. That this test measures much the same factor which appeared in the five original tests becomes clear when we correlate the score of the original fifteen subjects in the 'K'-test with their average saturations in the five tests. The correlation is 0.886, with a standard error of 0.06. The split-halves reliability of the test is 0.921 ± 0.03 , for thirty subjects. Sixty-eight pictures out of the two hundred were portraits, one hundred and thirty-two were landscapes.

Groups of subjects of varying size (between thirty and fifteen in number) were given this test, and also one or more of the five tests described on the following pages, in order to find out something about the relations between the 'K'-factor and the other qualities tested. Each of these tests was thought on *a priori* grounds to be related in some way to the 'K'-factor.

(1) *Extraversion—introversion*. It is not a new idea that there may be a connexion between temperament and aesthetic preferences; such a connexion is posited for instance on experimental grounds by Burt(6), and on mainly theoretical grounds by Evans(7).

In this investigation, the Heidbreder test of introversion⁽⁸⁾ was given to fifteen subjects; in addition each subject was judged by two independent judges with regard to the degree of extraversion or introversion he exhibited. There was fair agreement between the judgements and the results of the test, and a mean value was taken.

The correlation between extraversion and the 'K'-factor is definitely significant, being 0.723, with a standard error of 0.13. The extravert tended to prefer the 'bright', modern type of picture, the introvert tended to prefer the older masters.

(2) *Radicalism—conservatism*. It is a matter of everyday observation that radicals in politics and morals also tend to be radical in their artistic preferences; we would not expect the socialist and the conservative to have similar views on the merits of Laurencin or Modigliani.

Accordingly Vetter's radicalism—conservatism test⁽⁹⁾ was given to fifteen subjects; in addition each subject was judged by two independent judges with regard to the degree of radicalism or conservatism he exhibited. Again, there was fair agreement, and a mean value was taken between the ratings and the scores on the test.

The correlation between the 'K'-factor and radicalism is almost exactly the same as that between extraversion and 'K', namely, 0.721 ± 0.13 . This correlation also is definitely significant.

(3) *Youth—old age*. Young people might be expected to prefer the 'bright' type of picture, while those of an earlier generation might be expected rather to prefer the older masters. This expectation is borne out when age is correlated with the results of the 'K'-test; the correlation is 0.390, with a standard error of 0.16.

(4) *Preference for colour—preference for form*. It was considered likely that preference for colour might be correlated with high 'K'-scores, and preference, for form with low 'K'-scores. In order to test this hypothesis, a test was constructed which in some ways is an elaboration of tests described by Feasey⁽¹⁰⁾, Yokoyama⁽¹¹⁾, and Oeser⁽¹²⁾.

The subjects in this test were required to rank in order of liking ten polygons (taken from Birkhoff's collection⁽¹³⁾), and also ten colours (taken from Ostwald's selection of coloured papers⁽¹⁴⁾). When they had done this, they were required to rank in order of liking ten coloured polygons, in which the colour and the form were combined in such a way that the best-liked colour was put with the worst-liked form, and vice versa. Thus a conflict was set up within the individual, and the way in which this conflict was resolved indicates which of the two characteristics—colour and form—had more influence on the subject's

aesthetic preferences. (It was of course necessary for this test to prepare beforehand a set of the polygons cut out in each of the colours.)

This test correlated with the 'K'-test to the extent of 0.323, with a standard error of 0.17. This correlation, although highly suggestive, cannot be regarded as statistically significant.

There is also a correlation of 0.472 ± 0.24 between the colour—form test and the extraversion—introversion test. This correlation, which is on the borderline of significance, would seem to suggest that further experimentation with this test might well be worth while; particularly so as positive results were obtained from other colour—form tests by Scholl (15), and Enke (16), and also by Rohrschach (17). A review of this work is given by Kretschmer (18), pp. 190 *et seq.*

(5) *Preference for bright colours—preference for subdued colours.* It has been suggested that in preferences for colours a bipolar factor becomes evident which divides those who prefer bright from those who prefer subdued colours (19). As it was thought that preference for bright colours might be related to preference for the 'modernist' aspect of the 'K'-factor, a score was derived from the rankings of the ten colours used in the preceding experiment, which expresses in the form of a ratio the relative preference of each subject for the bright and the subdued colours.

This ratio, however, does not correlate significantly with 'K'; the correlation is 0.182, with a standard error of the same size.

V. SUMMARY

We are now in a position to summarize the results of our investigation. We found that the same two factors were active in each of the five sets of pictures used. One of these factors was the 'T'-factor, which was discussed in an earlier article. The other factor, 'K', seemed to divide the population into two different 'types', one preferring the modern, the other the older style of painting. This factor, identified provisionally with 'brightness', correlated with extraversion, radicalism, youth, and possibly with preference for colour. The colour—form test also appeared to be correlated with extraversion. These results are definite enough to suggest that further research into the relation between temperament and aesthetic preferences will prove fruitful not only in extending our knowledge of the 'type' factors in aesthetic judgements, but also in increasing our understanding of temperamental 'types'.

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PUBLICATIONS RECENTLY RECEIVED

Child Expression in Colour and Form. By HILDA WALLEY OLDHAM.
London: John Lane, The Bodley Head. 1940. Pp. 157. 9s. 6d. net.

This is a welcome addition to the literature that portrays the development of the child mind from babyhood to adolescence. Though the author is a mathematician as well as a psychologist, she gives no statistical treatment of the data she has gathered in preparation for the writing of her book, but treats them descriptively and always from the objective point of view, illustrating the conclusions she reaches by numerous drawings and some very beautiful coloured plates copied from the actual performances of the children whose work she studied. The lack of statistics in no way detracts from the value of the book; for we are reminded that statistics deal with data, and that these must always hold the first place. On the contrary, her method of treatment makes for a real popularization of psychology, since *Child Expression in Colour and Form* will appeal not only to professional psychologists, but also to all those who are interested in the gradual unfolding of child mentality, and wish to understand the way in which children of different ages look upon and interpret the objects of the world around them, how their perception of such objects alters as they mature, and how in the end they come to interpret them as adults do.

There are two particularly interesting chapters in the book, one on synaesthesia (followed by three other illustrative chapters showing the child's expression of odours, music and emotions in terms of colour and form) and the other on Child Symbolism and Surrealism. Dr Oldham speaks of associations, presumably contiguous associations formed in prior personal experience, as the cause of these synaesthesias; and where there is no fairly obvious reason for such a presumption, she has recourse to unconscious associations, and even associations due to racial inheritance, to account for them. Though most psychologists probably accept the association theory as accounting satisfactorily for the facts, there is another possible explanation of synaesthesia the author does not take into account which is possibly even more fundamental than this. The chapter on Child Symbolism begins: "The child draws what he knows, not what he sees"; and an amusing drawing by a child of six is that of a cat full of mice, one of which is seen in its gullet in the act of being swallowed: "so it is choking and had breath is coming from its mouth because it has eaten too many mice." The child also paints an object as he wishes it might in fact be, like the little girl who painted coloured rain. It enjoys a sense of power by drawing what it pleases and giving it a name, as did the child of three who drew a line and called it a train, and then a shorter line which was "a nice pussy". These are indications, well worth studying, of the inner drives beneath the child's expressions of himself in his primitive art-play. They are objective keys which open the lock of the door that gives access to his mind.

Dr Oldham writes with insight and sincerity. Her book can be recommended to those who are concerned with psychology, education, art, and developmental theory.

F. A.

Educational Psychology. By CHARLES JUDD. London: Geo. Allen and Unwin, Ltd. 1940. Pp. xx+566. 18s. net.

This book is a product of ripe experience and prolonged and often profound study. It is nevertheless written in a straightforward, clear and simple manner which will be attractive to most readers, whether they start with any knowledge of the subjects dealt with, or are complete beginners. Professor Judd covers an immense field, for he considers educational psychology to be "the science which describes and explains the changes that take place in individuals as they pass through various stages of development from birth to maturity" and the applications of the results of this study

to school procedure are only a part of a much wider discipline. Moreover, as he fully maintains in this book, his well-known keen interest in social determinants of education, a great many topics are dealt with which many exponents of "educational psychology" would regard as somewhat wide of the mark. In a sense the book seems to belong to older and more leisurely days, and while it is informed by a thorough knowledge of a mass of careful experimental work, it has comparatively little about tests and exceedingly little about statistics. This makes it all the better to read.

The Integration of the Personality. By CARL G. JUNG. London: Kegan Paul, Trench, Trubner and Co. Ltd. 1940. Pp. 313. 15s. net.

This book is in the main a restatement and development of the Jungian theory of the relationship of the conscious to the unconscious mind, and in particular a description of the various ways in which the unconscious may manifest itself. It is held that the personality can be fully developed only through the process of 'individuation', by which the phenomena of the unconscious mind are integrated into the totality of the ego. But this process, when extended from the personal to the collective unconscious, is fraught with danger, since the processes of the collective unconscious are so violent and so chaotic in their nature that they may come to dominate the ego altogether, the result being a psychosis. Thus only the exceptional individual will have the strength and understanding to undergo complete 'individuation'. In the past the less gifted individual was able to express and to deal with the unconscious in terms of myth, religion, magic or alchemy, all of which contain projections of the collective unconscious. But the rationalism and materialism of the last two centuries have bereft man of these outlets, and the repression of every mode of expression of the unconscious has at last resulted in general unrest, followed by an outburst of the libido in the insane violence which confronts us to-day.

Unfortunately, those who may have hoped for a clearer and more definite account of the Jungian theory of the unconscious will find this book disappointing, since its presentation is muddled and its expression far from clear. It consists of six lectures, two of which are devoted to studies of cases of 'individuation', one through unconsciously directed paintings, the other through dreams. (Incidentally, the latter provides a magnificent series of 'Jungian' dreams, but one which Dr Jung himself acknowledges to be of very unusual occurrence.) Another chapter deals with the projection of the unconscious in Alchemy. Two chapters describe the process of individuation, and the 'archetypes' of the collective unconscious. The final chapter raises considerable uneasiness in the reader's mind. If only the exceptional individual, the 'superman', is capable of a direct integration of the unconscious in the personality, how can the ordinary man deal with its disruptive functioning? Dr Jung, apparently basing his views on a rather superficial understanding of the potentialities, as against the actualities, of the Christian religion (especially of Protestantism), seems to dismiss the possibility of any help from that quarter. Is the ordinary man, then, to be surrendered without hope of release to the domination of the 'superman'? One is forced to conclude sadly that Dr Jung is giving a dangerous support to the cult of the Führer and its fallacies.

M. D. V.

Man and Society. By KARL MANNHEIM. London: Kegan Paul, Trench, Trubner and Co. Ltd. 1940. Pp. xxii + 469. 16s. 6d. net.

This book was first published in German under the title of *Mensch und Gesellschaft im Zeitalter des Umbaus*. It has, however, according to the author, been very extensively rewritten and extended. The basic idea is that the present is an age of reconstruction; that to search the past for values, whether of social functions or of social structure is somewhat futile, and that the fundamental ideas upon which an effective and desirable society is based have to change radically as the scope and structure of that society change. In a general way what the author is trying to do is to find a way of synthesising freedom with planning so that both may find the fullest possible expression in social life. The argument is intricate, long, very learned, with masses of foot-

notes and a wealthy bibliography. Contemporary changes have been so rapid that already many things in the book seem, for the time being, out of date; but that is certainly not Dr Mannheim's fault. Although the volume is the sincere expression of a mind both vigorous and contemplative, it is apt to treat 'planning' as a sort of slogan, a sort of word which wins large approval whether or not its precise implications are fully understood. It is tolerably easy to say that ways must be found to combine democratic forms of authority with the control which social planning implies, but most of the urgent practical problems concern perhaps less the forces that are in operation in society than the time limits within which those forces can be brought into effective operation. And the times of change are much less fully understood than the principles and sources of change.

The Plans of Men. By LEONARD W. DOBB. Published for the Institute of Human Relations, by Yale University Press. London: Humphrey Milford. 1940. Pp. xiii + 411. 18s. 6d. net.

While this book concerns directly only American social life and its authorities are almost entirely American authorities, it will nevertheless be found of very great interest and significance by many readers in this country. Dr Dobb is already well known here for his study of propaganda, and it is likely that this book will enhance his reputation. It is true that the greater part of it is written in a very general style of reference, and there is far more about the principles of human social planning and about illustrations in America of the application of these principles, than of any attempt to get any definitive and experimental determination of how far and in what directions planning of this kind can expect to be successful. But in this general manner the volume represents a genuinely important contribution to a topic which is now exciting lively interest in all countries. After a discussion of the nature of planning, the author passes in review various important departments of human activity in which planned programmes appear to be desired. In this way he considers biological, social, political, economic and psychological activities, and adds a little about the values that are inherent in planning. He then considers how planning in his sense of the term is actually being developed—still mainly in U.S.A.—and illustrates with discussion planning for the individual, for social life, for economic development, for political change, and that type of plan which has come to be called 'regional'. His final section is called "perplexing problems", and here he considers ability to plan, the need for planning and how to plan for the immediate future. Many students would beyond a doubt have preferred a somewhat more concise style of exposition, and a volume willing to take a bit more risk about concrete affairs. But as a statement of principles and movements which are bound to become of increasing importance, the book is one which deserves to be well known and widely discussed.

Population, Race and Eugenics. By MORRIS SIEGEL. Hamilton, Ontario: Published by the Author. 1939. Pp. x + 206. \$3.00.

This useful essay is very largely practical in its aim. There are four main parts to the book. The first is called Practical Eugenics. It is chiefly concerned with what may be done in a constructive manner to maintain and improve the human stock. It states fairly the facts, so far as they are known and can be briefly summarized, with regard to the declining populations of the more cultivated classes and makes practical suggestions which are both moderate and sensible. The second part is called Race Theories in Relation to Eugenics. This is highly condensed and is rather slight and jerky. The author is critical of race dogmatisms, but states briefly the main classifications which have been proposed on this basis. The next part is entitled Rational Marriage. Here the author argues that society should see to it that as far as possible eugenic considerations should play their part in all marriage contracts. The final part deals with Restrictive Eugenics and tackles the problems of feeble-mindedness, of mental disorders of a functional nature and of epilepsy. The author suggests methods

of dealing with all these problems and is throughout moderate but definite in his views. The essay is a very good one, clear, definite and positive. While it cannot lay any particular claim to originality either of thought or of treatment, it gives a responsible survey in brief of its whole subject matter.

Human Nature Writ Large. By F. CREEDY. Foreword by BRONISLAW MALINOWSKI. London: George Allen and Unwin, Ltd. 1939. Pp. 484. 15s. net.

The subtitle "A Social Psychologic Survey and Western Anthropology", is perhaps regarded as explaining the title, but neither is particularly clear. Mr Creedy is convinced that there are various "primal psychologic urges" (equally well called "Absolute Values") which it is somehow or another the purpose of society to realize. He tentatively selects as the most important of these: self-preservation, reproduction, co-operation with others, and creative intellectual activity. If these can be realized in a process of steady change all is well; but they cannot, for some of them are 'animal', and as soon as any mode of conduct has been achieved these stiffen such a mode into unyielding habit which fails to satisfy the demands of reason. Then society develops myths of one sort or another which purport to rationalize these fixities of action, and add their influence to the hampering effect of animal habits upon creative effort. From this situation arise the fundamental conflicts of primitive and modern society, and the main theme of the book is to illustrate and, within the limits of its general scheme, to explain all the main conflicts of Western civilization, whether in religion, in national organization, in science, in art, literature and metaphysics, or in economics. It will be seen that Mr Creedy casts an extremely wide net, and he succeeds in bringing up a good many catches that are worth studying. But the book suffers by attempting to cover too much ground. It is better to dip into than to read right through. In spite of Professor Malinowski's extremely glowing introduction the author does not show any very comprehensive knowledge of current social psychology. It would perhaps have been better if he had written a little less at large, and given a cleaner and clearer account of why in some particular realm the human mind proceeds by a process of myth-making and myth-breaking.

Suicide. A Social and Historical Study. By ROMILLY FEDDEN. London: Peter Davis, Ltd. 1938. Pp. 351. 12s. 6d. net.

The subject may be a gloomy one, but the writing is anything but depressing. It is rather curious that while a very considerable number of elaborate works about suicide have been written by French and German authors, very little systematic attention has been given to the subject by English writers. While Mr Fedden's general line of approach is historical, so that he recounts with spirit many stories of famous and infamous individual suicides and gives a reasonable amount of attention to social influences and movements which have produced various forms and frequencies of self-murder, he also writes very clearly and judiciously about the main motives for suicide. He even, in a final chapter, gives some, but not too many, statistics. The result is a book very interesting to read and not in the least morbid. Mr Fedden treats psychologists who have written extremely seriously about this topic with most excellent light-hearted respect and has many acute remarks to make about their theories. Altogether this is a most stimulating and interesting book, and better than a good many far more pretentious treatises dealing with this melancholy subject.

Psychomental Complex of the Tungus. By S. M. SHIROKOGOROFF. London: Kegan Paul, Trench, Trubner and Co., Ltd. 1935. Pp. xvi+469.

In this volume the author sets himself the task of presenting the psychomental aspects of Tungus culture as one of three types of ethnographic phenomena, the other two being material culture and social organization. According to Shirokogoroff the

psychomental complex consists of psychic and mental reactions to the milieu, in other words, attitudes and ideas. The psychic elements he thinks of as more permanent and definite than the mental elements. The exposition is divided up under the heads of (1) positive knowledge, (2) hypotheses, and (3) their practical consequences. Because of the vastness of the material, Shamanism, which really belongs under (3), is given a separate division.

Although the author seems to know the terminology of recent psychology and discusses various methodological and observational pitfalls of ethnographic investigation, the reader who is interested in the social psychological aspects of the Tungus people will be greatly disappointed with this massive folio because of its unsatisfactory psychological background. The dubious quality of the psychic and the mental is hardly justified in the text. Despite the author's constant reference to scientific objectivity and his original definitions, he treats psychomental complexes of groups as persistent entities. Not even the specific repudiation of such a conception in his conclusion alters the tenor of the whole treatise. Again, the author finds no incongruity in his acceptance of the idea that a psychomental complex is a system of conditioned reflexes and his belief that Shamans can actually read thoughts and communicate with others at a distance.

J. R. K.

How Life Began. By DAVID FORSYTH. London: William Heineman (Medical Books). 1939. Pp. xi+106. 5s.

The author rightly calls his essay "A Speculative Study in Modern Biology". It is original, intensely interesting and stimulating. The argument is already so condensed that it cannot properly be further summarized without loss. In general the view is that "biological life is a universal phenomenon... a manifestation of the whole world's surface". It is all one physical-chemical process with the development of any form of organized matter, though in its biological form it is specifically connected with solar radiation. In its developments towards greater and greater specialization it is a consistent application of a Principle of the Economy of Energy. Stated in this very bald manner the essay may appear to be nothing but sheer abstract theorizing, but it is a good deal more than that. As all readers of this *Journal* are likely to know, the author is a competent and skilled biologist, and no matter how radical or how general his views may appear he is ready with illustrations and instances. Most of the views expressed in this essay could be made the basis of prolonged argument, and perhaps the issues raised would at present still remain undecided. But the author is to be congratulated on a provocative and well stated piece of work.

A Psychologist's War-time Diary. By ANTHONY WEYMOUTH. London: Longmans, Green and Co. 1940. Pp. 300. 12s. 6d. net.

The diary begins on Friday, 1 September 1939 and finishes on Thursday, 29 February 1940. Its main interest lies, not in its comments on the War or the war situation, or in its remarks about Hitler, Mussolini and other people at a distance. At least this is not its main interest to-day, though possibly it may be at some time later; for all these comments are much the same as were made by a very large number of other people, and to the contemporary reader they will seem all too familiar. The main interest of the book at the moment is the large amount of material recounting personal contacts and impressions with various very much less disastrous people who have during this period, largely under the care of the author, taken part in B.B.C. activities. In this respect the book is admirable, and should provide both amusement and relief to a large number of readers, whether these are psychologists or not. When Mr Weymouth impinges upon academic psychology he has nothing impressive to say, but when he forgets the books and writes after the style of a combination of the doctor-novelist he is generally full of interest and sometimes achieves unusual insight.

Extra-Sensory Perception After Sixty Years. By J. G. PRATT, J. B. RHINE, B. M. SMITH, C. E. STUART and J. A. GREENWOOD. New York: Henry Holt and Co. 1940. Pp. xiv + 463.

The study of Extra-Sensory Perception has gained a definite foothold in the general field of Psychology in the past few years. The clouds of the battle which ensued after the publication of Rhine's original monograph have lifted sufficiently for an appraisal of the results reached to date to be made with some hope of impartiality. This is attempted here by a team of workers from Duke University. They have assembled results from the mass of experimental investigations in this field over the past sixty years, and made an effort to separate the wheat from the chaff. In order to do this, they have summarized all the serious criticisms levelled against ESP under thirty-five headings, and then examined each research to see whether it could be invalidated by these criticisms jointly or separately. Although a large number fall by the way, sufficient results are left untouched by criticisms yet brought forward for the reader to conclude that it is no longer possible to doubt the occurrence of ESP on rational grounds. This conclusion is strengthened by the fact that the President of the Institute of Mathematical Statistics has endorsed the statistical methods used by Rhine and his fellow workers, while the American Psychological Association went a long way towards endorsing their experimental methods. Ten of the most noted critics of ESP, whose opinions on the book were canvassed by the authors in order to present the other side of the picture also, mostly deal with minor points in their comments, and complete agreement does not seem such a forlorn hope now as it did once.

If the part of the book dealing with the occurrence of ESP leads to very positive conclusions, and presents a hopeful outlook for the future, that dealing with the nature of ESP is mainly negative. Several hypotheses are ruled out, but there seem to be no others to take their place. Clearly this position cannot be allowed to continue, and the programme of research outlined by the authors promises that a definite breach will soon be made in the stone wall that confronts us at the present.

The book has been carefully prepared and attractively produced, and is obviously destined to become the textbook for all those who are interested in this field of study. The bibliography is invaluable, as are the summary of criticisms and the many tables dealing with results of researches to date. Some readers may object at having to read through twenty-five pages of statistics right at the beginning of the book, pages unintelligible to the non-mathematical and for the most part familiar to the initiated. This section might with advantage have been relegated to an appendix, although as it is the twenty-one appendices provided slightly overload the task of the conscientious reader. In spite of these very minor points to which exception might be taken, the book is eminently readable, and what is more important, reliable and trustworthy.

H. J. E.

Vowel Sounds in Poetry: Their Music and Tone-Colour. By M. M. MACDERMOTT. Psyche Monographs, No. 13. London: Kegan Paul, Trench, Trubner and Co., Ltd. 1940. Pp. 148. 5s.

BRITISH PSYCHOLOGICAL SOCIETY

REVENUE ACCOUNT AND BALANCE SHEET AS AT 30 SEPTEMBER 1940

Revenue Account for the year ended 30 September 1940

EXPENDITURE		INCOME	
£	s. d.	£	s. d.
180	0 0	To Rent, 55 Russell Square	130 0 0
25	11 11	Use of Room for Office	17 6 8
7	19 9	Caretaker	2 9 8
252	0 0	Lighting and Heating	252 0 0
16	0 9	Secretary's Salary	73 1 3
109	16 7	Part-time Assistance	16 5 2
25	11 0	Printing and Duplicating	54 10 8
79	8 8	Expenses of Meetings	21 5 3
18	6 0	Postages and Telephone	4 12 0
4	12 0	Stationery	3 8 3
4	14 6	Insurance	10 10 0
10	10 0	Subscriptions to outside Associations	2 6 1
14	15 6	Audit Fee 1939	2 15 7
5	11 5	Teas	225 13 6
		Sundry Expenses	94 14 6
		Journals Publication Expenses:	
		General	320 8 0
		Medical	15 3 8
		Educational	
		Extended General Meeting 1940	
		Committee on Human Mental Measurements	
		Midland Branch Expenses	1 9 9
		Northern Branch Expenses	7 19 7
		Scottish Branch Expenses	1 0 0
		Cheque Books	42 18 1
		Removal of Library to Nottingham	13 5 0
		Legal Expenses re Premises	
		Legal Expenses re Incorporation—	
		On account	75 0 0
		Depreciation:	
		Library	62 6 7
		Office Furniture and Fittings	23 6 6
		Balance, being Surplus of Income over Expenditure	1153 7 9
			269 1 7
			£1422 9 4
			£1498 19 10
			£1422 9 4

£1422 9 4

£1498 19 10

Balance Sheet as at 30 September 1940

LIABILITIES			ASSETS		
<i>1939</i>	<i>£ s. d.</i>	<i>1939</i>	<i>£ s. d.</i>	<i>£ s. d.</i>	<i>£ s. d.</i>
Rent receivable in Advance		Cash at Barclays Bank Ltd.		498 17 10	1 12 2
Subscriptions in Advance		Postage Stamps in hand		...	...
<i>Publications Reserve:</i>		<i>Investments at Cost:</i>			
Balance as per last Balance Sheet ...	122 0 0	£300 5% Conversion Loan 1944-64...	318 9 9		
<i>Revenue Account:</i>		£320. 14s. 8d. 3½% Inscribed War			
Balance as per last Balance Sheet ...	...	Loan	3425 7 9		3743 17 6
<i>Add Surplus of year</i>	<i>5082 18 11</i>	<i>Note: Market value of above Securities</i>			
	<i>209 1 7</i>	at 30 September 1940, £3684			
		Rent, 55 Russell Square, paid in Ad-			
	5352 0 6	vance	...	45 0 0	
		Sundry Debtors	...	1 3 7	
		Subscriptions in Arrear	...	244 4 6	
		<i>Office Furniture and Fittings:</i>			
		Balance as per last Balance Sheet ...	158 0 0		
		Add cost of Library Shelving at Not-			
		tingham	75 5 0		
		<i>Less Depreciation</i>	<i>233 5 0</i>		
			<i>23 6 6</i>		209 18 6
		<i>Library:</i>			
		Balance as per last Balance Sheet ...	557 10 0		
		Add Expenditure during year ...	65 19 7		
		<i>Less Depreciation</i>	<i>623 9 7</i>		
			<i>62 6 7</i>		561 3 0
		<i>Monograph Publications:</i>			
		Balance as per last Balance Sheet ...	210 5 5		
		Less Amounts repaid during year ...	79 12 0		130 13 5
		Shares in the British Journal of Educa-			
		tional Psychology Ltd., at Cost ...			50 0 0
					£5486 10 6
					£5207 0 11

I beg to report that I have examined the foregoing Accounts with the Books and vouchers of the British Psychological Society and that I have obtained all the Information and explanations I have required. In my opinion the Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Society's Affairs according to the best of my information and the explanations given to me and as shown by the Books of the Society. The Securities appearing under the heading Investments have been verified by production of the Bankers' Certificate.

T. BARRETT,
Incorporated Accountant

S. J. F. PHILPOTT
Hon. Treasurer